An Analysis of the Fevers met with among Europeans in Calcutta, with a brief account of their Clinical Features and Treatment.

THESIS for the Degree of M.D.

by

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An Analysis of the Fevers met with among Europeans in Calcutta, with a brief account of their Clinical Features and Treatment.

I propose to give here, a brief acccount of the most important fevers met with among Europeans resident in Calcutta.

Having been on the staff of the large European Hospital there for over four years, I have had ample opportunity for studying clinically a large number of such cases, and it is chiefly from the clinical point of view that I wish to write, giving, at the same time, examples of each type with the temperature charts.

I need hardly say, that among medical cases, "fever" is by far the most common complaint for which a patient comes to hospital. Therefore it is important to be able to differentiate the various fevers, both from the point of view of treatment and prognosis. There undoubtedly was, some years ago, and still is, but to a less extent I am glad to say, a tendency to consider all fevers malarial, and to dose the unfortunate patient with quinine. This is a most valuable drug when given in suitable cases, but one which has, without doubt, been much abused in the tropics.

The/

The most important fevers met with are malaria and typhoid, others being kala-azar, heat-stroke, and a peculiar fever, resembling in some respects dengue, spoken of generally in Calcutta as "seven-day fever". This name was first given to it by Major Rogers, I.M.S. on account of its average duration to about seven days.

There are still undifferentiated fevers to be met with, but more accurate methods of diagnosis have already, and will further, reduce their number.

Among undifferentiated fevers I will first mention a type, the nature of which we are still in complete ignorance. It occurs particularly in the hot weather months, almost entirely disappearing when the colder weather sets in. My own opinion is that such a fever is in some way due to a disturbance of the heat regulating mechanism, brought about by the high atmospheric temperature in which one is compelled to live during many months of the year, this disturbance perhaps following exposure to the sun during the heat of the day. It is especially common among new arrivals, sailors, for instance, who often go about in the middle of the day warmly clad, and with very imperfect protection from the sun's rays. Such a fever is usually of short duration, and may begin with a feeling of chilliness - not a rigor. The temperature is irregular, most/

most frequently of an intermittent type, rising and falling, but with no definite periodicity. It does not, as a rule, go much above 101° or 102°. The tongue is perhaps slightly coated, and the patient feels generally indisposed. Beyond this nothing definite is found on examination, and no changes are noticed in the blood. A few days' rest in bed, an aperient and light diet is usually all that is necessary.

Such a fever is spoken of simply as "febricula" or "simple continued fever." A trivial ailment, but still, sufficiently common during the hot weather months in Calcutta, to call for comment.

Kala-azar.

The discovery of the Leishman - Donovan body, and its constant presence in Kala-azar, has done more, in recent years, to clear up the difficulties associated with the classification of fevers than any other discovery.

Formerly, such fevers - only too common in certain parts of Bengal and Assam and also to be met with among those who have never left Calcutta - were a constant source of confusion, being spoken of as "chronic malaria", "malarial cachectic fever" and so on. Yet they did not, in many ways, answer to the clinical description/

description of malaria.

In the great majority of cases, unless there happened to be a mixed infection, the malarial parasite was not found, and quinine did not produce the marked effect so rapidly seen in true malaria - in most instances, it produced no beneficial result at all. Still there existed this prolonged fever, associated with enlargement of spleen and liver, progressive emaciation, anaemia, often diarrhoea, dropsy and cancrum oris, frequently ending in death, the nature of which, until the discovery of the now well-known parasite, remained a puzzle.

The fever itself varies greatly in character, at times being continuous and resembling typhoid, at others, remittent, often shewing a double rise of temperature in the 24 hours. When improvement sets in the fever becomes intermittent. Such a sequence of events, I have occasionally seen in the same patient.

Some of the "low fevers" which patients so often talk about, are caused by the same parasite. The temperature may be normal in the morning, rising slightly in the evening to 99° or 100° and persisting, in spite of varied and continuous treatment.

If the patient is unable to leave the locality in which the disease is contracted or in which it is endemic/

endemic - better still the country - this will eventually end, in the majority of cases, in the severe and fatal form of Kala-azar.

Before leaving this kind of fever of which, in Calcutta, we do not see a great deal, I wish to say a few words about the diagnosis.

In the early stages, it is often most difficult, but in an advanced case, with the well-marked anaemia and emaciation, the peculiar puffy appearance of the face, the prominent abdomen with the wasted limbs below, often swollen and oedematous, the clinical picture is only too plain and the diagnosis clearly written on the patient's face. Some time ago, I had a child in the children's ward who presented these appearances most typically. She seemed to consist almost entirely of abdomen, and as she sat up in bed, she folded her hands in front of her, and so supported the enormous liver and spleen which appeared to fill the whole abdominal cavity. Such a case presents no difficulty in diagnosis - it is in the early stages that it is not easy to come to a definite conclusion as to the nature of the fever.

The only complaint may be slight fever; a temperature rising every evening to 99°, 100° or 101°; no enlargement of liver or spleen; in fact, no other physical/

physical signs.

Then it is only by a process of exclusion, that a tentative diagnosis can be arrived at. When examination of the blood reveals no malarial parasites, when quinine has little or no effect, the fever still continuing, in spite of a free administration of that drug. This last definitely excludes it from being of malarial origin. The internal organs also appear healthy, and in this connection, a very careful examination of the lungs is necessary, to exclude early cases of phthisis.

It is often only by carefully watching the patient for some time that it is possible to come to a definite conclusion as to the nature of the fever.

I have been able to follow a few cases to the end. They first came for treatment simply complaining of "low fever", and it eventually developed into marked and typical Kala-azar.

The fever may cease for a time, but every now and then relapses occur, and gradually it is observed that the spleen and perhaps also the liver, have become enlarged. Now, an examination of the blood will probably greatly assist, and will reveal those changes,(so thoroughly worked out by Major Rogers, I.M.S.) namely, a diminution in the total number of leucocytes/

leucocytes - one which becomes more and more marked as the case advances.

At this stage, a puncture of the spleen and the examination of the smear on a slide, will probably reveal the characteristic parasite, thereby clinching the diagnosis.

I have personally never done a spleen puncture in any of my cases. It is a small operation, but one which has been followed by serious consequences, even death. More recently, the parasite has been found in the blood obtained by puncturing the liver (a much less serious operation) also, I believe, in the peripheral blood.

Many of these cases, when admitted to hospital, have fever of a continuous type, and with a slightly enlarged spleen, they are apt to be diagnosed as typhoid. The temperature, after a varying interval, comes down by lysis, and perhaps remains normal or almost so, for a time, completing the clinical picture of typhoid. The absence of spots and diarrhoea counts for little, where both, as I shall show later, are so often absent from genuine typhoid in India.

The serum test, according to Widal, will aid in the diagnosis, for in the great majority of typhoid cases/

cases, a positive reaction is obtained at some time during the course of the illness. But it must be remembered, in this connection, that while a positive reaction is conclusive evidence, it is not so with the negative reaction, for I have seen undoubted cases of typhoid in which a positive Widal, after several examinations, was never obtained.

Here I would mention that it is not enough to be satisfied with the result of the first Widal, if negative, other samples of the blood should be tested at later intervals.

Another point of diagnosis in Kala-azar, is the double rise of temperature in the 24 hours, a feature so clearly shewn in a four hourly chart. The temperature, which may be of a remittent or intermittent type, shews two definite rises in the 24 hours, followed, in each case, by a remission.

To sum up:- The chief points to which attention should be paid in the diagnosis of this fever are:-

1. A prolonged fever, varying in type and degree; very slight but persistent, or more severe; continuous; intermittent or remittent.
2. A double rise of temperature in the 24 hours.
3. A gradual enlargement of spleen, and later, of liver also.

4./

4. A progressive anaemia and loss of flesh.

5. A marked and progressive diminution of the number of leucocytes.

6. Negative signs, absence of malarial parasites, negative Widal, and, in the early stages, absence of any disease - such as phthisis - to acccunt for the fever.

With regard to the prognosis, it can at once be said to be unfavourable. When cases are seen in the early stage, if the patients can leave the country (India) and return - where Europeans are concerned - to a temperate climate, the chances of a permanent recovery are greatly increased. But if the disease is at all advanced, and the spleen and liver have become definitely enlarged, the prognosis is distinctly bad, the disease usually advancing steadily from bad to worse in spite of everything that can be done. The occurrence of diarrhoea is a most serious complication and one extremely difficult to relieve.

When speaking about diagnosis, I mentioned the great importance of a total leucocyte count. Careful records should be kept of this, and any increase in the number of leucocytes is a favourable sign, often followed by an improvement in the patient's condition.

The only two serious cases which I have seen recover/

recover were both patients who had some acute suppurative process going on, and this would lead to a leucocyte increase. One, a child, had cancrum oris and gangrenous areas, followed by suppuration on both buttocks and wrists. She lay for days in a most critical condition, but gradually improved and eventually made a complete recovery. She has for over three years now continued in good health.

The second case was that of an adult who had, as a complication, an acute attack of otitis media. This was followed by a great improvement in his primary disease. I mention these two cases,- though they may have been coincidents - but they are the only two serious ones which I saw improve markedly, the child, to all appearances, making a complete recovery.

With regard to Treatment. I may at once say that so far it is very disappointing. Quinine has been given freely and in large doses, both by the mouth, and subcutaneously. While it may, after a time, lessen the amount of fever, converting a continuous type into a remittent or even an intermittent one, still it has little or no lasting effect. Arsenic is of no value whatever in this fever. I have also tried bone marrow, with the same disappointing results.

Taking a clue from the improvement which followed

in those cases where suppuration or an increase in the number of leucocytes occurred, I have tried to bring this increase about by artificial means.

Major Rogers, I.M.S., in the bacteriological department, very kindly prepared for me a staphylococcic serum of a certain strength, of which I injected $\frac{1}{2}$ to 1 c.c. subcutaneously. This gave little, if any, beneficial result, although in one case I "succeeded" in producing an acute inflammation followed by an abcess at the site of inoculation. However, no improvement resulted. I next tried to produce suppuration by means of a seton. An ordinary piece of tape was inserted into the abdominal wall - without any antiseptic precautions - and in an advanced case with a very large spleen. Although free suppuration took place and the spleen underwent a very marked diminution in size, the fever also becoming decidedly less, diarrhoea unfortunately began, a complication which rapidly produces exhaustion and a fatal termination. Nuclein, a drug which is said to produce a leucocyte increase, I also tried, with disappointing results, and now one of the latest treatments to be recommended is Atoxyl - a drug which has been used with beneficial effect in other forms of trypanosomiasis. Personally, I have not yet had an opportunity of using this, but those who have done so have not been able to report any better results.

The/

To face page 14

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name _____ *Caste* _____ *Age* _____ *Disease* _____ *Date of Attack* _____ 190 . *Result* _____ *Date of Result* _____ 190 .

Dates of Observation.																															
Days of Disease.																															
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
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No. 43 (New No. 44), B. C. M. D. Chart lost.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name M. L. *Caste* Europ: *Age* 36. *Disease* Kala-Azar *Date of ~~Attack~~* adm: 2. 6. 1905. *Result* —— *Date of Result* —— 190 .

Dates of Observation	June 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Days of Disease.	9																									
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
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A.M. P.M.

The treatment, therefore, is largely symptomatic. One point can not be too forcibly emphasised, and that is that once the diagnosis of Kala-azar has been made or even strongly suspected, the patient should be advised to leave the country at once in which the disease was contracted, and to return to Europe. In such a courselies his most favourable opportunity of a complete recovery.

Case No. 1. F. L. aged 36.

Chart No. 1.

Admitted to hospital with a history of having had fever off and on for about six months. Patient could not tell us much about the nature of his fever, except that at times it was severe. He was very weak and anaemic. The spleen was considerably enlarged, extending four inches below the costal margin in the nipple line. The liver was also enlarged, extending from the sixth rib to three inches below the costal margin. He was in hospital for a month, and treated chiefly with quinine, but with only slight improvement. The chart No. 1 shows well the type of fever so commonly spoken of as "low fever". Observe how the temperature, after the first few days, varies between 99° in the morning and 100° in the evening, coming down to normal in the morning a few days before the patient/

patient left hospital.

On the second day of his admission, the double rise is distinctly seen.

No malarial parasites were found in the blood. Such a case, with a history of six months irregular fever, enlarged spleen and liver with anaemia, presents little difficulty in diagnosis. And this is still further verified by a careful examination of his chart while in hospital.

Unfortunately I have no record of a leucocyte count in this case.

Heat-Stroke.

Another form of fever, of which I happened to see a number of cases during the month of June 1905, does not, as a rule, give rise to any difficulty in diagnosis. The condition is only too obvious when the patient's temperature is taken. During the four hot weathers I was in Calcutta, we had comparatively few admissions for heat-stroke, except in the month of June 1905, when there was quite a number of cases. The heat was very oppressive; a high atmospheric temperature was present, associated with a very high degree of moisture in the air, two factors which appear, as one can readily understand, to be particularly conducive to heat-stroke.

Of/

Of the various names which have been applied to this condition, I consider "heat-stroke" one of the best. It is better than "sun-stroke", as the patient may never have been actually exposed to the sun's rays, and it is certainly a more appropriate name than either "heat-apoplexy" or "heat-asphyxia." The theory that it is a specific fever and due to a definite micro organism, (as proposed by Dr Sambon) has, I think not been proved. If it is of microbic origin, it is an organism only present under certain atmospheric conditions. Most of the cases of heat-stroke were sailors, particularly engineers. Although intemperance does certainly favour the occurrence of this serious malady, the majority of the patients were young and temperate men in the prime of life. But fatigue, intemperance, debility and overcrowding must certainly be mentioned as predisposing causes.

The onset is usually sudden, although the patient may have been feeling somewhat peculiar before the actual attack comes on. He may have noticed that his skin was dry and hot, and had a feeling of drowsiness, and perhaps of suffocation.

This preliminary stage is rapidly followed by coma and a marked degree of hyperpyrexia. Usually, by the time the patient is seen, he is completely unconscious, with/

with loud and stertorous breathing; temperature in the rectum 107°, 108° or even 109°; pulse rapid, full and bounding at first, later becoming weak and irregular; face congested, may be cyanosed; the pupils varying greatly but never minutely contracted, usually become widely dilated towards the end, when a fatal result is impending. Convulsions, sometimes of an epileptic character, at other times like tetanus occur; delirium is very rarely seen.

Such was the condition of most of our patients on arrival at the hospital. Unless vigorous steps are at once taken to reduce the temperature, death rapidly follows. Several cases were actually dead on arrival, others died just after arriving at the hospital.

The prognosis in such severe cases is, of course, serious, and especially so in one addicted to alcohol or in the stout and debilitated. Still it is impossible to say what will be the result at first, as some of the most desperate cases may be brought round by prompt and energetic treatment.

In this connection, I think there can be no doubt that several lives might have been saved had the ship's surgeons - possibly also the captains - been more on the alert to take prompt measures for treatment, instead of packing the unfortunate patients into an ambulance/

ambulance and off to hospital. In every vessel sailing in the tropics, brief instructions should be printed, giving the officers and crew information as to the precautions necessary to be taken in order to guard against heat-stroke, noting also the warning symptoms and giving instructions as to what should be done immediately a case occurs.

As to diagnosis: this, as a rule is not difficult. The hyperpyrexia at once distinguishes it from the condition of coma occurring in renal disease, in diabetes, or from alcoholic and other poisons. Also from most cerebral lesions, except where a haemorrhage occurs into the pons, which is often associated with a high temperature. But in the latter case, the rise in temperature follows the occurrence of unconsciousness and does not precede or occur concurrently with it, as in heat-stroke. Again, in pontine haemorrhage, the pupils are usually minutely contracted, which they rarely are in heat-stroke.

Treatment. The first essential is to reduce the temperature. For this, the patient should be laid out on a stretcher or bed, and packed in ice while a stream of cold water - iced, if possible - is poured over his head and chest from a slight elevation. The ordinary Indian "Mussack", or goat skin bag of the "bhisti" or water-man, is very useful for this purpose.

At the same time, the temperature should be frequently taken in the rectum. These measures are persevered with till the temperature falls to 103°, when the patient is removed from the cold pack, gently dried and covered with a thin blanket, an ice-cap applied to the head and, if necessary, hot bottles to the feet. At this stage, also, cardiac stimulants will be necessary and of these, the best are digitalis and ether, given hypodermically.

One point which forced itself very strongly upon me, was the injurious effect of giving strychnine in any shape or form. Very often, before our arrival, a hypodermic of strychnine had been given, either preceding admission, or by the assistant on duty at the hospital. In these cases, the tendency to the occurrence of convulsions, (one, always present) was greatly increased. I have never seen any good result from artificial respiration, when such was necessary, and antipyretic drugs are worse than useless.

When convulsions are severe a few whiffs of chloroform amy be necessary.

In one or two cases, where the patients were stout, plethoric and markedly cyanosed, blood-letting was tried, 8 to 10 oz. of blood being removed, but I doubt if with any beneficial result. The occurrence of vomiting and sweating/

Chart No III

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATUR

Name J. Case. Caste Europ. Age 26. Disease Heat. Stro

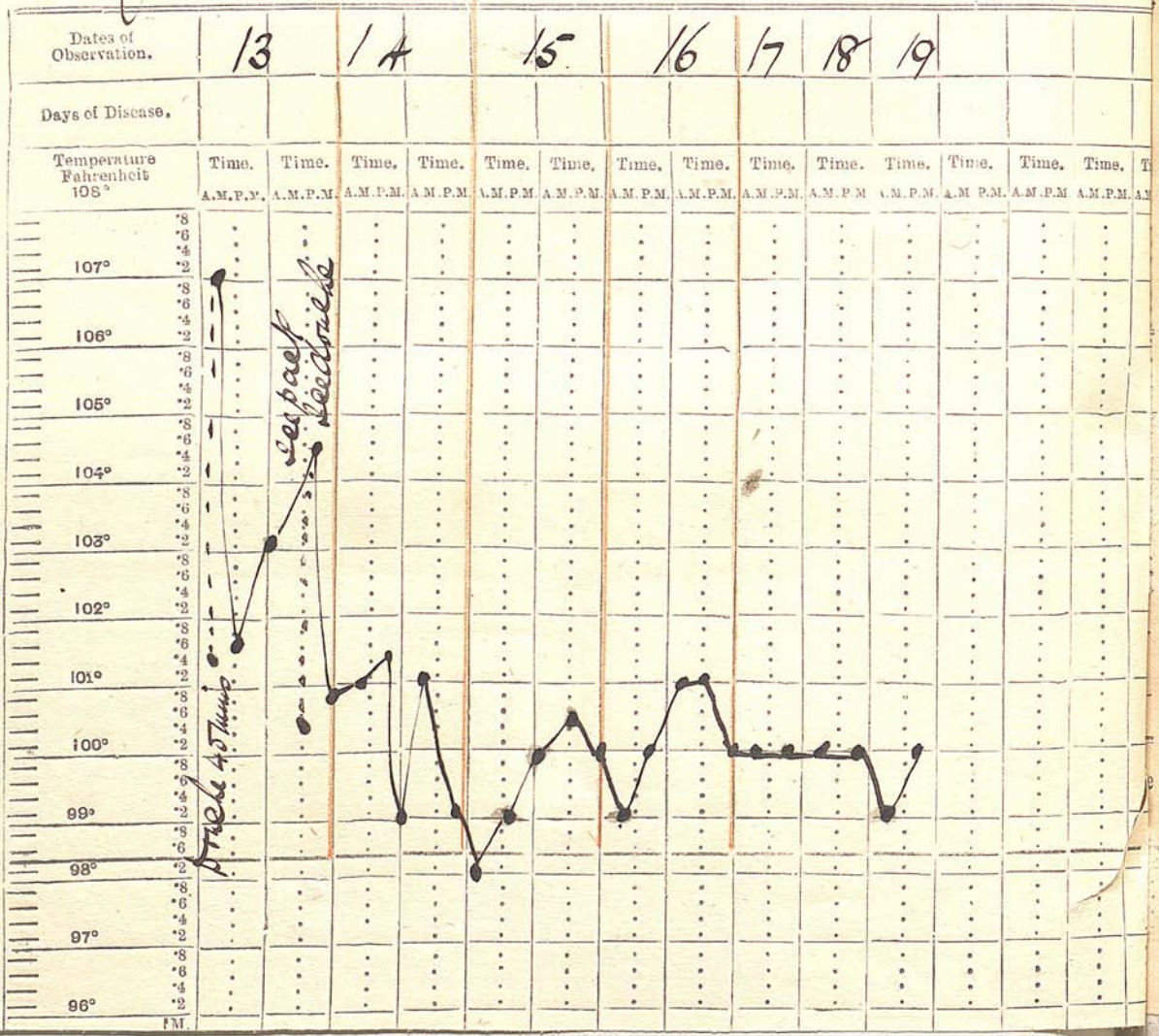

Chart No II

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATU

Name E. Wall Caste Russ. Age 38 Disease Heat-St

Dates of Observation.	14	15	16	17	18	19		
Days of Disease.								
Temperature Fahrenheit 106°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
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sweating, when the temperature falls, may be looked upon as favourable signs.

For some days after, the patient will probably suffer from slight irregular fever, headache, and a general feeling of soreness. He requires to be kept quiet, on a light diet, and the bowels carefully regulated. After a severe attack of heat-stroke, great care should be taken in again being exposed to the heat of the sun and if possible, all cases should be sent to a cooler climate, as soon as they are fit to travel.

Case No. I. E. Wall. European, aged 58.

Chart No. II.

Admitted at 5 p.m. on 14 : 6 : 1905, quite unconscious with loud stertorous breathing. Temperature in rectum 108°. Packed in ice and douched till the temperature fell to 102°; made a good recovery. See Chart No. II and notice the continued slight fever for some days after admission.

Case No. II. J. Cave, aged 26.

Chart No. III.

Admitted at 9 p.m. on 13 : 6 : 1905. Patient had been feeling seedy on 12th, went to his work again on 13th and about 3 p.m. complained of a headache. His skin felt hot and dry. He went to bed and "slept".

At/

At about 7 p.m. he was found in his cabin delirious and unconscious, skin hot and burning.

Temperature on admission 107° in the rectum. Patient quite unconscious, with laboured stertorous breathing, pupils widely dilated, pulse 136°, full and bounding. He was packed and douched till the temperature fell to 101.4° in the rectum. At midnight, temperature rose again to 104.6° and patient was once more douched, till the temperature fell to 101°. He became conscious about 2 a.m. His chart - No. III - will show the irregular fever for some days after the attack.

Another point to be noted in this case, is the necessity for carefully watching the temperature after it has once been reduced. A rise is very apt to occur again, and no doubt had it not been checked, in this case, it would have continued to rise perhaps to the height it was on admission.

One other interesting point in connection with this patient:- he was, by occupation, a marine engineer, and he assured me he had not been exposed to the sun at all for some days, but had been working hard down in the engine room on board his ship.

In neither of these cases did the temperature go above 108° and both recovered. All in which it went above/

above 108° on admission ended fatally, and as they died very shortly after being brought to hospital, no temperature charts were prepared.

I now come to the description of three of the fevers more commonly met with in Calcutta, namely "Seven day fever", Malaria and Typhoid. I shall consider them in that order.

"Seven day fever" is so called by Major Rogers, from its average duration of seven days. It is a fever of which I saw a large number of cases during the four hot-weathers I was in Calcutta. It occurs particularly during the hot-weather months, May, June and July, the number of cases diminishing during August and September, almost entirely disappearing during the cold weather. Thus, it differs markedly in its seasonal prevalence from Malaria.

Clinically, the fever usually starts suddenly, in a person previously in good health, with a feeling of chilliness - seldom amounting to rigor - sever headache, pains in the back and limbs. The temperature rises rapidly to 102° or 103°, pulse slow, face flushed, no coryza or nasal catarrh, tongue coated in the centre. After the first day the temperature falls considerably, and runs along at a lower level for four, five or six days, when it again rises to 103° or/

or 104°. The next day this is followed by an abrupt fall to normal, which continues.

Taking the chief features of this fever more in detail, we find that the headache is often very characteristic, being chiefly frontal. When asked to shew where the pain is worst, the patient at once places a finger and thumb on each temple.

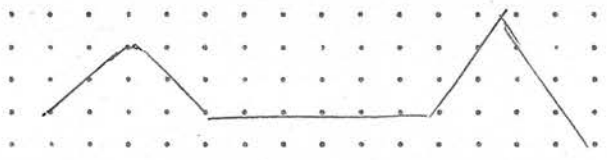
The tongue, also, presents an appearance which is of great assistance in diagnosis. It is coated on the dorsum, but the edges are red and clear. These two features give the tongue a very striking appearance, and one which differs greatly from that in typhoid or malaria.

The pulse calls for attention. Resembling the slow pulse of typhoid, it seldom goes above 100 p.m., and even with the terminal rise to 103° or 104°, it will be found that the pulse is only 90 or even 80 per minute. This is of great importance in distinguishing this fever from malaria.

The liver and spleen are not enlarged, and, as a rule, nothing abnormal is detected in the respiratory system. Rashes are fairly common, especially one resembling that of measles - so much is this the case, that it is often difficult on first examination, to distinguish between the two.

The/

The temperature chart is most characteristic in a typical case, presenting, what has been so aptly described by Major Rogers, as the appearance of a saddle back. The initial rise is followed by a fall, the temperature remains at a lower level for the next few days. Then comes the terminal rise, often to a higher degree than the initial one.



Such is, roughly, the course of the fever in a typical case, and I enclose some charts which closely follow this type. So closely do they follow it, that when a patient is seen, and the day of his illness known it is possible to predict, fairly accurately, on his chart what the course of the fever will be.

However, this does not occur in every case. The temperature will sometimes run along in a straight line without any remission, often between 102° and 103°, rendering the diagnosis extremely difficult. I have records of cases (which see) when it seemed impossible to diagnose this fever from typhoid, except by waiting till about the seventh day. And in these severe types of the fever, the patient often looks ill, is drowsy and heavy, and the tongue does not/

not present the characteristic appearance. A Widal would be of little assistance, for it can seldom be obtained during the first few days in typhoid. It is strange that such a comparatively mild fever, with no mortality, should be so difficult to diagnose in exceptional cases - from typhoid, yet that such is the case will be seen from some of the accompanying charts.

I have often seen cases come into hospital during the terminal rise. They have had fever at home and and been getting on well, as they thought, till about the sixth day or so, when the temperature has shot up again, getting alarmed, they hurry into hospital.

One can see, too, how easy it is, without careful enquiry into the history of such a case, to mistake it for one of malaria. The patient is brought into hospital, a dose of quinine given, and next day the temperature is down to normal. Quinine is continued for some days, and the temperature, not rising again, further confirms the diagnosis of malaria. Such mistakes, however, can be avoided by careful enquiry into the history of the case, and by a microscopical examination of the blood for malarial parasites, before quinine has been taken. My rule in hospital has been to have a blood smear of every patient admitted for fever taken by the house surgeon before any quinine has been/

been given. At the same time the date of his illness is carefully enquired into, and noted on his chart.

The average duration of this fever, as its name implies, is seven days, the final rise taking place, generally, in the afternoon or evening of the sixth day and the temperature falling to normal on the morning of the seventh.

Among European patients it is usually possible to get a fairly accurate history. An attack may last only five or six days; I have never seen one of less than four days' duration.

Convalescence is rapid, there are no after pains and once the temperature falls and the patient is put upon full diet (which can be done almost at once) he rapidly recovers. I have never seen a relapse - second attacks may occur, but not relapses. When a second attack does occur, it is usually the following year. I know of a case in Calcutta, where each July for three years, the person in question, a medical man, has had an attack, each one being milder than the last. It is particularly among new comers to Calcutta that this fever is prevalent, therefore a large number of cases in hospital were from the sea-faring population.

As to treatment, there is nothing particular to note/

note, in fact there is no specific treatment. Quinine is useless, indeed it only increases the patient's discomfort, diaphoretics, phenacetin with caffeine citrate, aspirin and such like drugs may be given to relieve the pains, aperients to regulate the bowels, and a milk diet. The patient should rest in bed while the fever lasts. During the terminal rise, I have noticed that cold sponging, "packing", and the like have very little effect in reducing the temperature. When it has fallen to normal, the patient may be put on full diet and allowed up and about. If necessary a tonic may be given.

The prognosis is good; the mortality, nil; and recovery usually complete, no ill effects being left. And now as to the nature and diagnosis of this fever. The nature of it is still a much disputed point, and at a meeting of the medical section of the Asiatic Society of Bengal, opinion among medical men in Calcutta was very much divided, the majority considering it a specific fever of itself, the minority looking upon it as dengue. In my own opinion, if this fever which I have described is dengue, then the accounts of that disease, as we find them at present in the leading text books on tropical diseases, will have to be considerably altered. I have never, that I am aware, seen/

seen a true case of dengue, but from the description of it given in ~~in~~ Manson's "Tropical Diseases" there are many points of difference. In the first place, although this "seven-day fever" is fairly prevalent during the hot weather months in Calcutta, I have never seen wide spread epidemics of it such as are described of dengue.

Again, the pains are not of the break-bone type, in fact, in the majority of cases they would scarcely be described as severe, and they are limited chiefly to the forehead and small of the back. There is no recrudescence of the pains during the terminal rise of temperature, and once it falls to normal, they go entirely. In these respects "seven-day fever" differs greatly from dengue, where the severe pains recur again during the terminal rise and often during convalescence. Finally, relapses are common in dengue, while they must be rare in "seven-day fever." I have never seen one in a very large number of cases. Convalescence has always been rapid and uninterrupted. The course of the fever in this and dengue differs, and I have not seen the slow pulse and characteristic tongue, described in connection with the latter.

Reading the description of dengue as given in Manson's "Tropical Diseases", the points upon which I should/

should lay particular stress in differentiating it from the above fever are:-

1. The greater severity of pains in dengue, giving it the name of "back-bone fever."
2. The actual crisis which occurs in dengue on the second, third or fourth day - usually about the end of the second day - accompanied as it is with diaphorsis, diarrhoea, diuresis or epistaxis. Such a crisis I have never seen in "seven-day" fever. It is true the temperature falls on the second day, but only to a lower level - seldom or never to normal - and then runs along this lower level till the terminal rise occurs.
3. The return of pains during the terminal rise in dengue, "perhaps in more than their original severity" (Manson), which I have not seen in seven-day fever.
4. The rheumatoid pains which continue for some days or weeks after the temperature has fallen to normal, and also during convalescence, in dengue; while convalescence after seven-day fever is uninterrupted and free from pains.
5. The tendency to the occurrence of relapses in dengue, and the highly infectious nature of the fever.

These, to me, constitute the essential points upon/

upon which the two fevers differ, but until the definite causal agent (probably a microbe) has been discovered, the nature of "seven-day" fever must remain a debatable point.

From Malaria, this fever is distinguished by the pains in the small of the back and joints, the temperature curve, the appearance of the tongue, rash, the non-enlargement of the spleen, absence of parasites in the blood and the non-beneficial effect of quinine; also the slow pulse.

From Influenza, by the complete absence of any coryza, or bronchial catarrh and the course of the temperature.

In certain severe cases there may be great difficulty in diagnosing this non-serious fever, from that very much more serious one - typhoid. Of course the presence of the characteristic spots, diarrhoea or a positive Widal, would settle the diagnosis, but the first and the last of these are not present, as a rule, during the first week of typhoid, and the same applies to enlargement of the spleen, which can rarely be felt before the seventh or eighth day. I have records of several cases (which see) where it seemed to me only possible to settle the diagnosis by waiting and carefully watching the patient, treating him, in the/

2 face p. 34

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 532—16-11 1907- 7446—34,500—24

Chart No IV

No. 43 (New No. 44). B. C. M. D.

Halliday ward Bed 14

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name A. Roumelis *Caste* Greek *Age* 27 *Disease* Seven day Fever. *Date of Attack* 9.9.0 1908. *Result* _____ *Date of Result* _____ 190 .

September.

Dates of Observation.	5	6	7	8	9		10		11		12		13		14		15		16		17	
Days of Disease.					1		2		3		4		5		6		(7)		8		9	
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
107°					Quinine grs. xv c.m.																	
106°																						
105°																						
104°																						
103°																						
102°																						
101°																						
100°																						
99°																						
98°																						
97°																						
96°																						
PULSE PER MINUTE M.					120/120	100/100	82/80	80/80	86/98	90/80	96/90	84/86	98/90	94/100	100/100	78/84	70/72	60/60	50/60	84/60		
PULSE PER MINUTE E.					96	94	96	90	96		90		100		100		60					
RESPIRATIONS PER MINUTE M.					28/20	28/26	24/28	26/24	24/20	30/30	24/22	22/24	28/26	28/28	28/28	24/24	22/24	20/22	24/30	26/24		
RESPIRATIONS PER MINUTE E.					34	24	28	26	30		22		30		26		22					
BOWELS (No. of Stools)						1		2		1		1		0	PE	1		0	0	P E		1

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11 1907—7446—34,500—24

Chart No V

Halliday ward Bed 4

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name William Chambers *Caste* Europ: *Age* 45 *Disease* 7 day fever. *Date of Attack* _____ 190 . *Result* _____ *Date of Result* _____ 190

Dates of Observation.	June 10	11	12	13	14	15	16	17
Days of Disease.	5	6	(7)	8	9	10	11	12
Pulse per minute M.			84 94	76 78	78 78	78		
Pulse per minute E.	84		84	72				
Respirations per minute M.			24 24	22 16	20 22	30		
Respirations per minute E.	24		24	18				
Bowels (No. of Stools)	2	2	0	E 1	2	2	1	1

Temperature Fahrenheit 108° … 107° … 106° … 105° … 104° … 103° … 102° … 101° … 100° … 99° … 98° … 97° … 96°

Time. A.M. P.M. (8 6 4 2)

Sponged 1 hr

Sponged 30 mins Packed 3 hrs

Quinine grs X O.M.

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11-1907—7446—34,500—24

Chart No VI

No. 43 (New No. 44), B. C. M. D.

Mackenzie Ward. Bed 9

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name A. McDonald Caste Europ: Age 42. Disease 1 day fever. Date of Attack 2. 8. 1908. Result _____ Date of Result _____ 190 .

August-

Dates of Observation.		5		6		7		8	
Days of Disease.		4		5		6		(7)	
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
PULSE PER MINUTE M.		84 88	88 80	72 88	88 92	92 76	56 74	72	
PULSE PER MINUTE E.		88	84 92	88	88				
RESPIRATIONS PER MINUTE M.		24 24	24 28	36 32	32 28	28 22	22 20	20	
RESPIRATIONS PER MINUTE E.		24	24 38	32	28				
BOWELS (No. OF STOOLS)		P 1		1		0		P	

Quinine 8 grs X O.m

Changed 30 mls Rect 7 hrs

Vomit 1

Signature.

the meanwhile as for typhoid.

Case No. I. Chart No. IV.

This shows a typical case from beginning to end. The patient, having been originally admitted for venereal disease, develops fever while in hospital. Note the initial rise, followed by a fall and the final rise on the sixth day, with abnormal temperature on the morning of the seventh, giving the characteristic saddle-back appearance to the chart. Observe also the slow pulse, even in the terminal rise. With a temperature of 103°, 104°, the pulse rate is only 84 p.m.

Case No. II. Chart No. V.

Shows that of a patient admitted in the middle of an attack. The terminal rise is well seen, and with a temperature of 104° the pulse is again only 84 p.m.

Case No. III. Chart No. VI.

Another of the same. The patient was admitted the day before the terminal rise, which took place on the evening of the fifth day, the temperature coming down gradually on the sixth, and reaching normal on the morning of the seventh.

Case/

page 35

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste ________________

Name ________________

Hospital or Dispensary ________________

Disease ________________

Period { *From* ________________
{ *To* ________________

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11-1907- 7446—34,500—24

"7 day fever of severe type", temp: running continuous but still showing the saddle-back type with terminal rise. Note also the slow pulse.

Chart No. VII

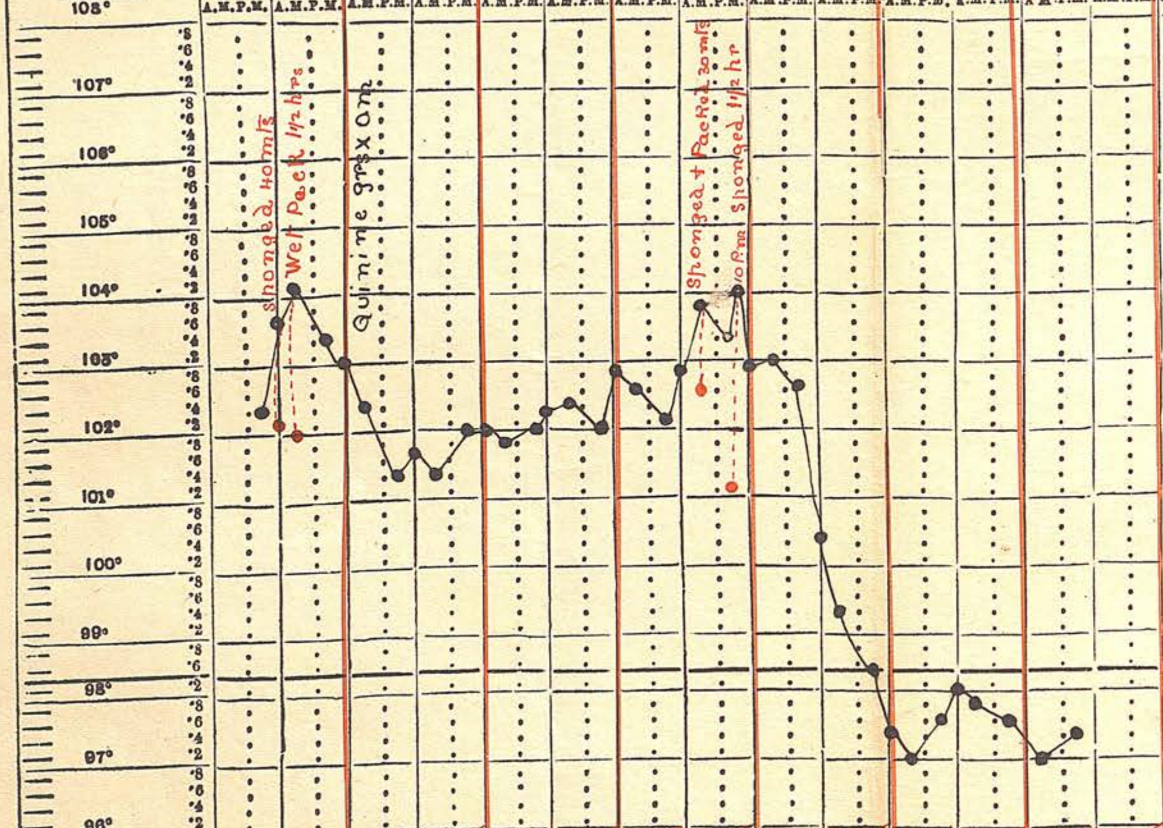
Mackenzie Ward. Bed II

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name M. Joachim *Caste* Armenian *Age* 16 *Disease* 7 day fever *Date of Attack* 27. 8 1908. *Result* ______ *Date of Result* ______ 190 .

Dates of Observation.	July 29		30		31		August 1		2		3		4	
Days of Disease.	3		4		5		6		(7)		8			
Time.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.
Pulse per minute M.	100	84 50	88 88	76 60	80 80	60 88	80 72	80 80	80 80	66 74	60 46	58 52		
Pulse per minute E.	96	88	88	80	80	88	50	96	76	72	56			
Respirations per minute M.	20	26 32	20 24	28 28	24 24	28 40	28 40	16 24	24 30	20 24	20 22	16 16		
Respirations per minute E.	24	28	24	24	24	28	26	28	24	24	20			
Bowels (No. of Stools) ...		1	P	3		2		1		1		1	2	



Vomit 2

____
Signature.

Case No. IV. Chart No. VII.

Here we have an example of a severe case. The patient was admitted on the third day of his illness with a temperature of 102.2° which rose that evening to 104°, and for three days ran steadily along at 102°, continuing to rise on the evening of the sixth day, and falling to normal on the seventh.

The boy looked ill, was heavy and drowsy, complained of severe headache, no pains elsewhere, tongue thickly coated, slow pulse, in fact he had all the appearances of a commencing typhoid. This is a type of case which gives rise to much difficulty in diagnosis, for many of the characteristic features of seven-day fever are absent. Still, when the completed chart is examined, there is no difficulty in recognising the nature of the fever. The initial rise is plainly seen, with the slight fall, and, lastly, the terminal rise with abnormal temperature on the seventh day.

Case No. V. Chart VIII.

Another case that looked, on admission, very ill. Temperature 102.6°, pulse 92, respirations 24. He said he had had fever for three days, with severe headache, vomiting, and pains in the limbs and body. Tongue/

page 36

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 559—1 co-11-1 906—7257—39.0 0 24

Chart VIII

No. 43 (New No. 44), B. C. M. D.

Mackenzie Ward Room 2

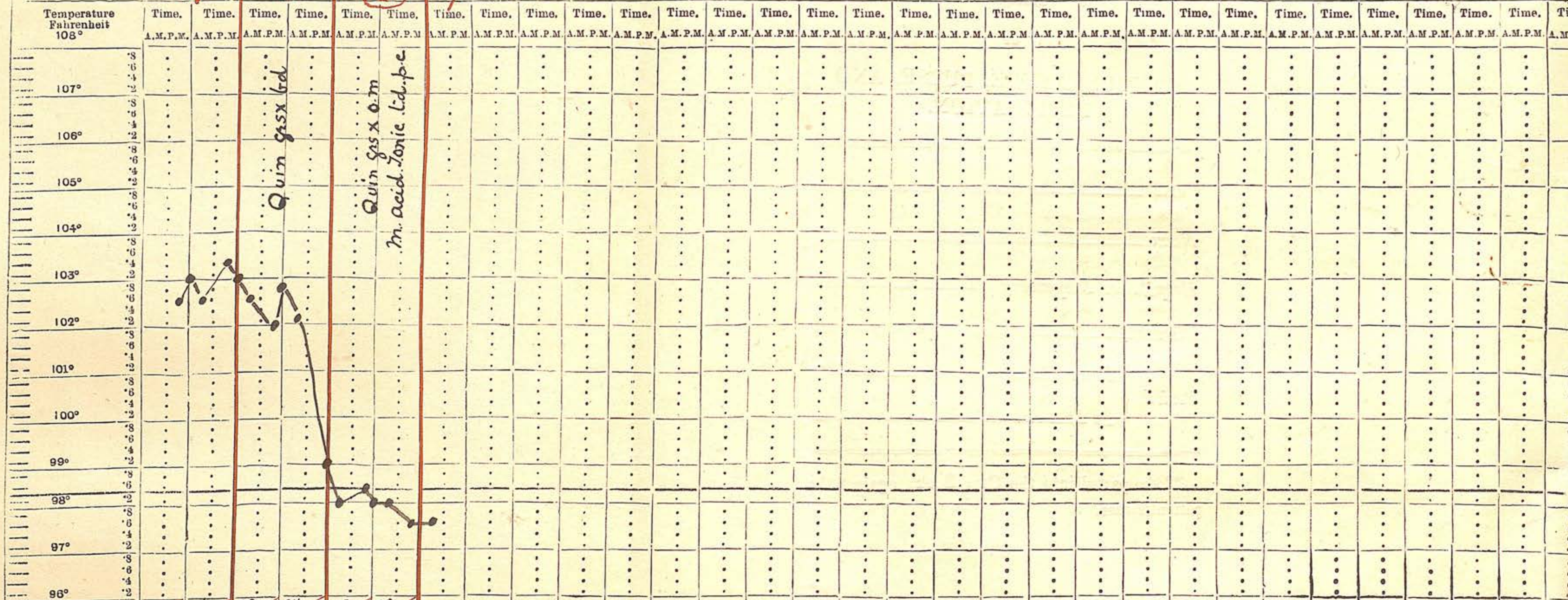
RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name F. Robertson *Caste* Scotch *Age* 31 *Disease* ______ *Date of Attack* 11-9 1907. *Result* ______ *Date of Result* ______ 190

Dates of Observation. September	14	15	16	17	18
Days of Disease.	4	5	(6)	7	8

Quin gr. 5 x t.d.

Quin gr 5 x o.m.
m. acid. Tonic t.d.p.c.



	14		15		16	
Pulse per minute M. / E.	92 / 96	96 / 96 / 88	88 / 96 / 88	84 / 84 / 72	72 / 80	80 / 80
Respirations per minute M. / E.	24	20 / 20	20 / 20	24 / 24	20 / 20	20 / 20
Bowels (No. of Stools)	P 5		0		P 1	

Signature.

Tongue thickly furred all over, bowels constipated; Patient very drowsy and heavy. Here again were all the appearances of a commencing typhoid. The patient's temperature remained steadily between 102° and 103° for the first two days, falling to normal on the third, (sixth of illness) shewing the true nature of the fever. He also had pains in the back and limbs.

Malarial Fever.

I now come to malarial fever, and about this I only intend to say a few words, chiefly upon points which have been brought to my notice with regard to diagnosis and treatment.

The term "malaria" has been, and still is, a much abused one. Numerous cases are returned as "ague", which, on a more careful examination, would have proved to be anything but malarial.

I have mentioned, with regard to "seven-day" fever, that when the patient is seen perhaps on the fifth or sixth day of his illness with a temperature of 103° or 104°, one or two doses of quinine having been given, the next morning the temperature has fallen to normal and, under continued administration of quinine, remained there. This sequence of events would have occurred had not a grain of quinine been given. Thus it/

it can be seen how easy it is to come to the conclusion, without careful examination and enquiry into the history of a case, that the disease dealt with was malaria.

Often, too, have early cases of phthisis and of liver abcess, been treated as malaria - dosed with quinine until at last, the drug producing no beneficial result, suspicions have been aroused, and the true nature of the disease detected, often after the loss of much valuable time. In a country where malaria is common, it can be understood how easy it is to fall into such errors.

In the diagnosis of malaria, there are three points upon which special stress should be laid, namely:-

1. <u>The periodicity of the fever.</u> This is particularly well seen in the intermittent types where, on looking at the chart, it is possible often at once to diagnose the nature of the fever. The rise in temperature often occurs at the same time every day - sometimes, but by no means always, preceded by a rigor or at least a feeling of chilliness, and this is followed by profuse diaphoresis, though the latter does not occur nearly as often as the text-books would lead one to/

to suspect. This periodicity is not nearly so well marked in the malignant type of fever, where the temperature may run a continuous course for twenty-four hours, followed by a remission varying greatly in degree. Still, even in these severe forms, a certain periodicity is present. It is, of course, in hospital practice, exceedingly rare to see the typical charts of the different forms of malaria, as given in text-books on the subject, because the disease is checked at once by the use of quinine.

2. The reaction to quinine. Quinine may be looked upon as a specific in the treatment of malarial fever, and a fever which does not disappear after the administration of it in satisfactory doses for two or three days, may be put down as non-malarial. As to the dosage and method of administration, I shall discuss these when considering the treatment of malarial fevers.

3. The presence of malarial parasites in the blood. It can be said at once, that the presence of the parasites in the peripheral blood clinches the diagnosis, but their absence by no means negatives malaria. In the first place, at certain stages of the disease - in some cases - they are absent from the peripheral blood, or so few as only to be found after/

after prolonged search. Secondly, many patients have taken quinine before being seen, and a single dose of that drug - ten to fifteen grains or even less - is sufficient to drive the parasites away from the peripheral circulation.

A blood smear should be prepared from each patient suffering from fever at once on admission, before any quinine has been given, and it should be stained by Leishman's modification of Romanowski's stain, (a method which fixes and stains at the same time). The smear is best made by means of a needle, the finger or lobe of the ear being pricked, and a small drop of the blood placed upon a clean slide near one end. The needle, a round one, should then be laid flat across the slide, on the drop of blood, which is allowed to run along it, not quite to the edges of the slide. The needle is then drawn along the slide. In this way an even layer of blood is obtained, which is fixed and stained by Leishman's stain, dried on a piece of blotting paper, and examined at once (if desired) with an oil immersion lens, no cover-glass being used.

The method is simple and quick, matters of great importance. Here may be mentioned another point which has been worked out by Rogers, Stevens and Christopher, to/

to aid in the diagnosis of malaria. That is the differential leucocyte count, an increase in the large mononuclear leucocytes being very strongly in favour of malaria. This method has this great point in its favour - it is not in any way influenced by the previous administration of quinine.

As to the question of the diagnosis between severe malarial remittent fever and typhoid (often a matter of difficulty, in the early stages particularly), the first point of great importance is the temperature chart. Although there are fluctuations in typhoid, they are not nearly so well marked, as a rule, as in remittent malaria, where the temperature seldom runs along within two degrees for forty eight hours. At the same time, the pulse should be noted; the slow pulse of typhoid as compared with the rapid of malaria.

The other signs are chiefly negative ones, namely the absence of spots, diarrhœa or abdominal distention in malaria, and the fact that the spleen is much more enlarged than in typhoid.

Then there is the blood examination, either the finding of the malarial parasites or, if the patient has been taking quinine, the alteration in the differential leucocyte count, with an increase in the larger/

larger mono-nuclear cells. Also the Widal reaction; finally, the therapeutic test.

With regard to treatment: there is one drug, and one only, for malaria - that is quinine. There are certain points in its administration upon which I particularly wish to lay stress. How frequently quinine is given in doses which might almost be said to be worse than useless. I have seen patients come to hospital suffering from genuine malaria and found, on inquiry, that they had been taking quinine in perhaps three to five grain doses, once or twice a day, with no improvement. I usually give fifteen grains of quinine sulphate dissolved in an acid solution, twice daily, and in the majority of cases, the fever has gone by the second or third day. It seldom lingers beyond this, and should it do so, an extra dose of ten grains for a day or so will stop it. One important point, in passing, be sure the patient is taking the drug. Quinine is not pleasant, and patients have been known to spit it out at once.

In some cases of malaria - usually the severe remittent types - nausea and vomiting are present, the moment the medicine is taken, it is vomited up again. In such cases it is useless to persist in giving quinine by the mouth - only valuable time is being lost - it may then be given subcutaneously, or, in the most/

most serious cases, by intravenous injection. I should reserve this last method entirely to the above type of cases and in those severe ones asscciated with coma. Very terrible results have been described as occurring after hypodermic injection of quinine - such as sloughing at the seat of injection, ulcers, abcesses and even tetanus. I may say that I have often used this method, and never seen the slightest ill result, beyond, perhaps, slight pain and a little induration at the site of the injection. I may have been fortunate.

In giving quinine this way certain precautions are, naturally, necessary. The first is absolute cleanliness, the skin being prepared in the usual way, as for an operation, the hypodermic syringe and needle carefully boiled, also the quinine solution. If such precautions are taken, there will be little risk of tetanus, abcesses or the like. When such accidents do occur, it is almost certain to be due to some fault in the technique.

Secondly, it is advisable to use an easily soluble salt of quinine, and for this purpose, the bi-hydrochlorate is one of the best, being soluble in one in two of water. The sulphate is one of the worst.

Lastly, the injection should not be given immediately under the skin, but well into the subcutaneous/

subcutaneous tissues. The same precautions also apply when the drug is given intravenously. If these points are carefully attended to, I think there will be little risk in giving quinine either subcutaneously or intravenously, and such valuable additions to the treatment of severe malaria may be used with safety. But in the ordinary routine of cases, they are not necessary.

Next, as to the time at which quinine should be given. There used to be a very general belief, and there is still, especially among native patients and native practitioners, that quinine should not be given when fever is present, but only when a remission occurs.

This, I may say at once, is entirely wrong, and having come to the conclusion that the fever is malarial, quinine should be given at once. I have seen no ill effects, beyond perhaps a slight increase in the patient's discomfort. In a mild case it may do no harm to wait - it certainly can do no good - but in a severe one, that remission which is waited for may never come, or not until it is too late to save the patient's life. Cerebral and fatal symptoms may develop while the physician is waiting for the temperature to fall.

In pregnancy, the administration of quinine is a difficult/

difficult matter. A correct diagnosis is here the first essential. Having come to the conclusion that a case of malarial fever has to be dealt with, complicated with pregnancy, I am sure it is infinitely safer to treat the patient with quinine than to allow the fever to continue unchecked. This course in itself would probably lead to abortion or premature labour. Even if it did not go as far as that, it would certainly greatly debilitate the patient. A smaller dose than usual might be tried at first, say five grains thrice daily. If this be not sufficient, the dose should be gradually increased. A very useful suggestion has been made with regard to the hypodermic injection of quinine. Kleine has shewn that this drug is very much more slowly excreted and therefore, presumably, more slowly absorbed, when given hypodermically as compared with administration by the mouth. If this be so, would it not be safer in pregnant women, to give quinine by hypodermic injection rather than by the mouth? There is less chance of a sufficiently large dose being absorbed at one time, to set up uterine contractions. It is a point I shall bear in mind the next time I am placed in that difficult position.

Children bear quinine well, - a child of ten years/

years can stand as much as an adult. A child of five can take, easily, five grains twice or thrice a day and, to an infant of one year, two grains twice or thrice daily can be given with perfect safety.

Of ill effects from quinine I have seen none, beyond the temporary buzzing in the ears and deafness, but these soon disappear when the quantity is decreased.

I can scarcely believe, as has been suggested by some, that quinine is alone responsible for the production of black-water fever. I have given up to ninety grains in the day continuously for some time, during the treatment of kala-azar, without any signs of black-water fever. Quite recently, there was a case in hospital, where fifteen grains only of quinine sulphate were taken once, three weeks before the onset of black-water fever. In that case, I think quinine can certainly be exonerated.

The administration of quinine should be continued for some days after the cessation of all fever. For a week at least in full doses, to prevent any recurrence, and after that, ten or fifteen grains on two consecutive days in each week for a month or six weeks. This is particularly necessary if the patient continues to live in the malarious locality where the fever was contracted.

This/

This method of administering quinine in ten to fifteen grain doses on two consecutive days in each week is one of the best methods of using this drug as a prophylactic against malaria.

Quinine is, unfortunately, a most unpopular drug among natives - why, it is impossible to say. But the fact remains that it is extremely difficult to get them to take it, and almost impossible to persuade them to continue its use after the fever has ceased. This latter remark applies with almost equal force to educated Europeans, and no illness has a greater tendency to recur unless thoroughly and persistently treated for some considerable time. The drug probably derives its unpopularity from the fact that it is used by many native practitioners in too small, and consequently ineffectual doses, to stop the fever.

A word in conclusion. No trust should be put in pills or tabloids of quinine. Pills, when freshly prepared, may be all right, but they soon become as hard as shot and pass through the alimentary canal as such. The same remark applies, with even greater force, to tabloids.

Other drugs have been used in the treatment of malaria, arsenic, methylene blue, and so on. But I have never used them, and so far, the necessity has never/

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P J. Press—A 632 - 9-11-1904—7045—21,000—78

Chart No IX

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name Michael Rhodes Caste Europ: Age 14 Disease Ague. Date of ~~Attack~~ 19.7. 1905 Result — Date of Result 4.8. 1905

Dates of Observation.	July 19	20	21	22	23	24	25
Days of Disease.	2/6						

Temperature Fahrenheit 108° — 107° — 106° — 105° — 104° — 103° — 102° — 101° — 100° — 99° — 98° — 97° — 96°

Time. A.M. P.M.

Pulse per minute M. / E.

Respirations per minute M. / E.

Bowels (No. of Stools) 0 0 3P

Bloodlist

Signature.

never arisen when quinine is available. Arsenic and iron are useful in the after treatment, to overcome the anaemia which is such a marked feature after malaria.

Case No. I. Chart No. IX.

This is a typical example of ague.

The patient, Mabel Ridsdale, aged 14, was admitted for fever from which she had been suffering for about twenty six days. The history was most definite, of a daily rise in temperature every afternoon about the same time, always preceded by a rigor. She had two typical attacks in hospital on two successive days, which very greatly verified her account of her illness. On each occasion there was a rigor, followed by a rapid rise of temperature and an equally rapid fall, so very characteristic of ague. The spleen was enlarged and could be distinctly felt at the costal margin. An examination of the blood shewed numerous benign tertian parasites. She was put on quinine at once, eight grains twice daily the first day, thrice daily the second day and four times during the day for the next two days, and then the doses were gradually reduced. After the second day, the temperature never rose again.

Such is a typical case, and the wonder is that this/

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

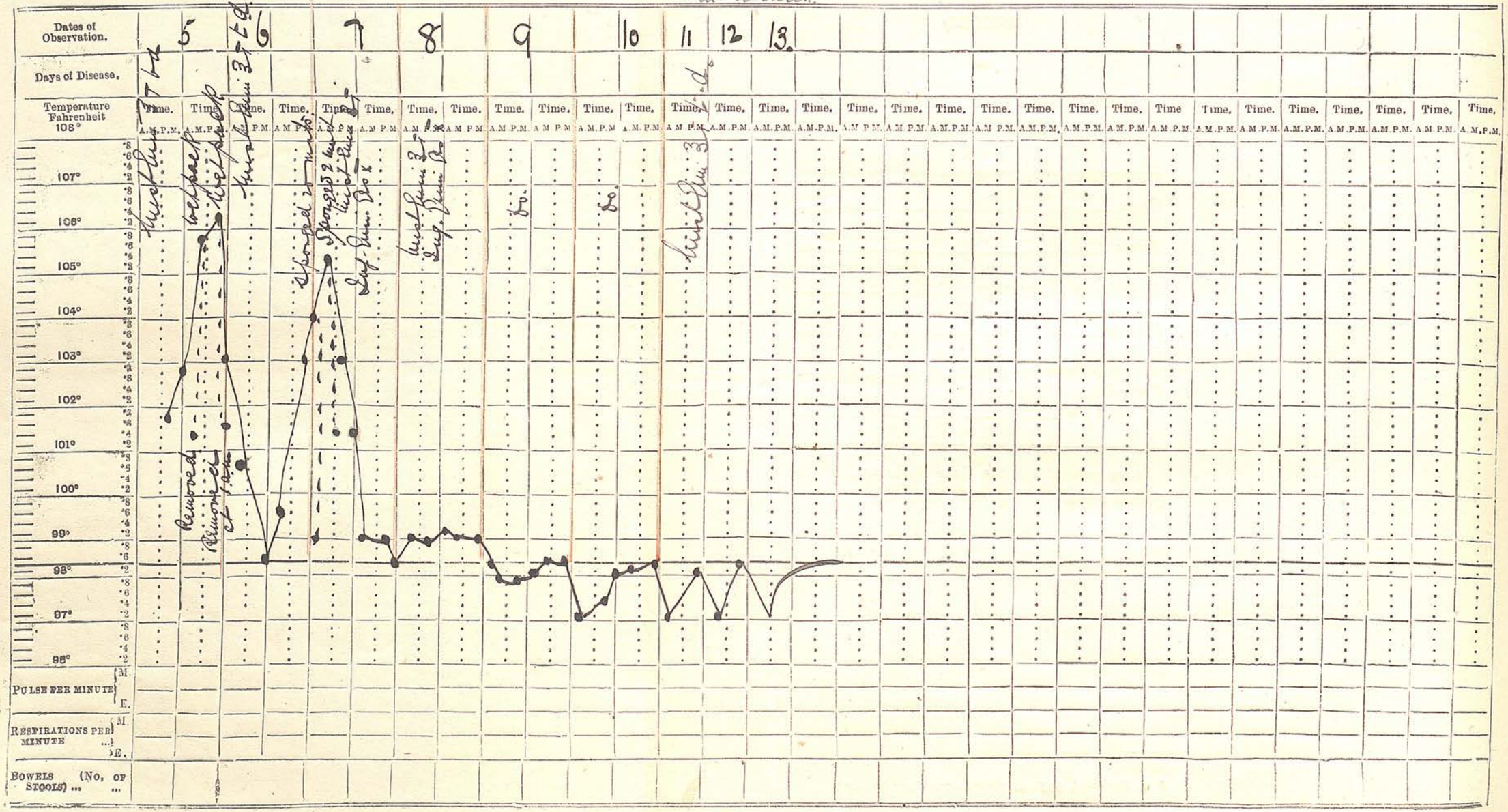
P J. Press—A 632 - 9-11-1904—7045—21,000—78

Chart No X

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name W. Salters *Caste* Europ: *Age* 19 *Disease* Malaria M. Tertian. *Date of Attack* 5-6 1905 *Result* 4 *Date of Result* 17-6- 1905.



Signature

this was allowed to go on for twenty six days without any treatment. The patient came from Barrackpore, fourteen miles out of Calcutta and an extremely malarious locality.

Case No. II. Chart No. X.

W. Salters, aged 19. Had been suffering from "fever" for seven days before admission. Fever began with rigors, got worse towards the evening, and left him in the morning. Patient extremely pale and anaemic; spleen not enlarged. Examination of a blood smear showed numerous malignant tertian parasites.

Looking at this chart, it differs very much from the last one. There is not the same rapid rise and fall of temperature. On each occasion the rise, in this case, lasted over half a day - that is to say, from the time the temperature began to rise till it fell again, there was an interval of twenty four hours. Whereas in benign tertian ague, the whole attack will be over in two to four hours.

This case was treated with quinine both by the mouth and by hypodermic injection, with rapid recovery.

Case/

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A. 632—9-11-1904—7015—21,000—78

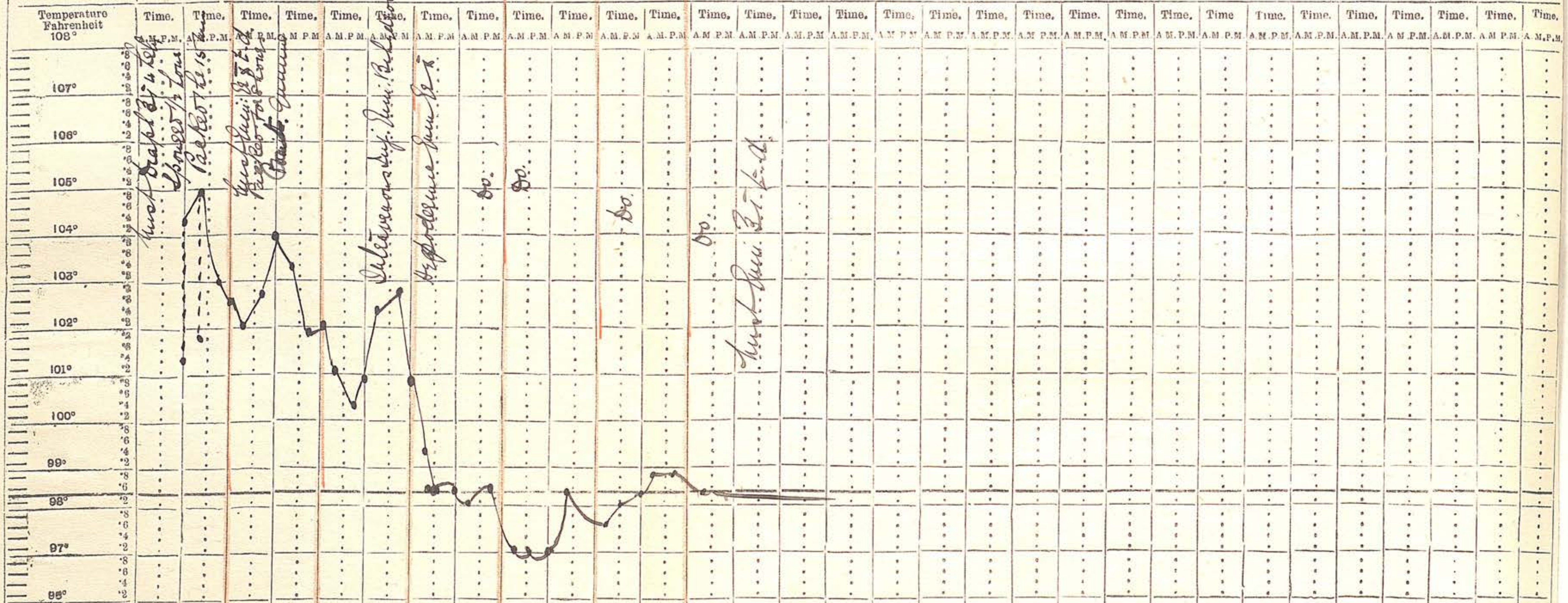
Chart No XI

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name Hugh Gibson. *Caste* English *Age* 29 *Disease* Malaria Remittent / malignant tertian. *Date of Attack* ______ 190 . *Result* ______ *Date of Result* ______ 190

Dates of Observation.	June 10	11	12	13	14	15	16	17
Days of Disease.	8	9	[illegible]	11	12	13	14	15



Pulse per minute M. / E.						
Respirations per minute M. / E.						
Bowels (No. of Stools) ...	0	1	1	0	2	2
Vomit	1	7	2	0		

Signature.

Case No. III. Chart XI.

Hugh Gibson, aged 29. Admitted with a history of having had continuous fever for the last seven days. No rigors, but severe headache and vomiting for the last three days. Temperature on admission 104.4°, pulse 120, and of small volume.

The patient stated he had contracted "fever" in Central Africa a year ago, and just before this attack he had had all his teeth extracted. He was obviously seriously ill and the diagnosis was doubtful. The fever at first was thought to be the result of septic absorption from his mouth, or typhoid. However, an examination of the blood revealed numerous malignant tertian parasites - in fact it was simply swarming with them. The patient was at first given quinine sulphate, ten grains, by the mouth thrice daily, but owing to incessant vomiting this had to be stopped, and on the third day, as his condition was becoming very critical and cerebral symptoms were beginning to shew themselves, ten grains of quinine bi-hydrochlorate were given intravenously with striking result. The next morning his temperature was normal, vomiting had stopped, and the cerebral symptoms, delirium, drowsiness and the like entirely gone. Quinine was continued subcutaneously for the next four days, and then given by/

by the mouth. There was never again any rise of temperature.

It can not be doubted, I think, that but for the intravenous injection of quinine, this patient would have developed that rapidly fatal type of malaria, the cerebral; and this case also shews well the value of the above method of giving the drug in serious cases. The temperature chart is interesting, too, in shewing the remittent nature of the fever. Unfortunately the record of pulse and respiration has not been copied in the chart.

I have never seen so many parasites in each field of the microscope as there were in this case.

Typhoid Fever.

Now we come to typhoid fever, a disease which carries off more Europeans annually than any other in India, especially young people in the prime of life. I have careful notes of all my cases, 69 in number, for two years, and it is largely from them that I wish to base the remarks I have to make upon this important and serious fever.

Like typhoid at home, it varies greatly in its symptoms and severity - some cases running an uninterrupted course throughout to recovery, and others being/

being complicated from the very beginning. It is impossible to say at any time whether an attack will prove to be severe or mild, complications so often arise when they are leastxexpected. In one case under my notice the attack was so mild, that had it not been for a very positive Widal 1 in 100, typhoid would scarcely have been diagnosed. The patient, however, was warned that although his attack was a mild one, yet the same precautions were necessary as if it had been more severe. But in spite of what he was told, he got out of bed one day to allow a servant to make it, when the nurse's back was turned. That evening, his temperature went higher, and the following day higher still, till he finally went through an exceedingly serious illness, which gave all in attendance upon him great cause for anxiety. And all because of a slight indiscretion.

No race in India is exempt. At one time it was thought that typhoid fever was peculiar to Europeans in India and that the natives of the country did not suffer from it, but this has now been proved to be erroneous. I have seen undoubted cases myself among natives, and others have been recorded by various observers. I look upon typhoid as one of the common continued fevers among native children, and this occurrence/

occurrence of the disease in childhood possibly explains why it is less frequently seen in adults.

A striking feature in my cases is the number I had in the children's ward. Many of the patients were drawn from the poorest part of Calcutta, where they live in close proximity to, and in the midst of natives.

The disease is particularly prevalent during the hot weather months of the year, there being always more cases in hospital from April to August (the hot dusty months) than during the remaining ones.

As to sex: among adults it is undoubtedly more common in males than females, but in the case of children, both sexes appear to be equally affected.

The onset is rarely abrupt. In the great majority of cases, the patient has been "out of sorts" for some days before the fever has actually started, and very rarely are rigors and a sudden rise of temperature seen at the beginning. As a rule, by the time the patient is admitted into hospital, signs and symptoms of typhoid are definitely present. The temperature is high and assumes a continuous type, in most instances rarely coming below 102°. In the majority of cases a temperature chart shewing a continuous fever, remaining between two degrees for forty/

forty eight hours, may be taken as one of typhoid fever. The most common exception occurs in some of those curious cases of seven-day fever which I have already described. This continuous type is, likewise, rarely seen in malaria, even in the severe malarial remittents, there are as a rule very much more marked remissions.

To continue: the pulse in typhoid is usually slow at the beginning, or rather slow as compared with the degree of fever present, for a pulse of 90 to 100 is frequently found with a temperature of 103°. Often, the pulse becomes dicrotic. I suppose this condition is seen more in typhoid than in any other kind of fever.

The tongue is uniformly and thickly coated, abdominal symptoms are often found, with distention and tympanites. Diarrhoea may, or may not, be present, and when it is the stools have the typical appearance so well known. But diarrhoea, in my series of cases, has been more frequently absent than present.

The rash is not, by any means, a constant sign and, I should say, more generally absent in cases in India than in England. Perhaps this may be partly due to the difficulty in recognising the typical spots during the hot weather months owing to the presence of prickly heat and the like.

The/

The spleen can generally be felt at the costal margin on careful palpation, but not, as a rule, before the end of the first week. The enlargement is not so marked as in malarial cases, and it is a very much softer spleen.

The patient has a heavy, dull, listless appearance, even at the very beginning. Delirium is commonly present in the later stages.

Lung complications often occur, especially in children, and add greatly to the difficulty of diagnosis, particularly when seen for the first time with a patch of consolidation actually present. Sweating is not commonly seen. I have only noticed it, to any great extent, in one severe and fatal case, brought into hospital about the tenth day of illness. This patient was continually bathed in a very profuse perspiration. Cardiac complications are rare, beyond the degenerative changes which the heart muscle undergoes along with the other muscles of the body, and indicated by a feeble and indistinct first sound, together with a weak pulse.

Haemorrhage occurs in a certain number of cases, and I have noted that it is seen particularly in those where diarrhoea has been present, and in patients brought to hospital at a late stage.

Perforation, I have not seen in any of my cases.

The/

The most severe ones have been, as a rule, among those patients who went about trying to do their work during the early stages of the disease.

Diagnosis. In many cases this presents no difficulty, in others, there is, for a time at least, great doubt as to the nature of the fever.

Among the more important points to be noted may be mentioned:-

(1) The general appearance of the patient, who is probably heavy and drowsy, and looks seriously ill.

(2) The temperature of a continuous type. Whether it be high or low, the continuity is the characteristic feature. (This has also been mentioned in speaking of malarial remittent fever.)

(3) The comparatively slow pulse, as compared with the temperature. Frequently, too, dicrotic in character even in the early stages.

(4) The enlarged spleen, which is felt to be a soft one on palpation.

(5) The thickly coated tongue.

(6) The abdomen often distended and tympanic.

(7) Diarrhoea and spots, if present.

Examination of the blood reveals nothing very definite. There is said to be a leucopaenia during the course of typhoid, but this is nothing marked nor very characteristic.

With/

With regard to the Widal reaction. This varies greatly, in some it is obtained at an early stage, in other cases, not till the end of the second or third week, and occasionally (in undoubtedly typical cases) not at all. It is rare to obtain a positive reaction before the sixth to eighth day, and then, it is a valuable aid in establishing the diagnosis. But, in the first few days, when the difficulty is greatest, the Widal reaction is disappointing, a negative Widal being of no value in settling the diagnosis, while it is extremely rare then to obtain a positive reaction.

Here let me add, that a negative Widal, throughout the course of the illness, is not to be relied upon. I have seen cases, typical and characteristic in every respect, when at no stage during the illness was a positive Widal obtainable. Such an absence in the Widal reaction however, occurs only, as a rule, in severe cases, when not much doubt remains as to diagnosis.

I give in a tabulated statement later the dates at which a positive Widal was obtained in my series of cases, and it will be seen to bear out what I have said. Another means of diagnosis, which I heard of only last year (1908), and which I tried recently with promising results, is the use of a watery solution of methylene blue/

blue (1 in 1000). A few drops of this solution added to about half a test-tube of the patient's urine, turns it an ordinary bluish colour when not typhoid, but a grass green if typhoid is present. The contrast is very marked, and so far, I have found this test to hold good. A striking example occurred in one of my wards shortly before leaving Calcutta. Two patients were admitted the same day, both with a temperature of 103°. One gave a positive reaction with methylene blue, and went through a typical attack of typhoid fever. The second gave a negative result, and was removed the following day to the small-pox hospital.

Prognosis. This should always be guarded, even in the mildest of cases. There is nothing to shew that serious complications may not occur at any time, perhaps as the result of some slight indiscretion on the part of the patient. It is rash to say in any case that there is no danger, until the patient is quite convalescent. On the other hand, so long as the patient is alive, there is always hope. I have seen some of the most desperate cases recover.

The mortality varies greatly - according to Osler, from 7 to 20% in hospital cases. In my series, I had a mortality of 8.1% This includes every case, no/

no matter at what stage admitted to hospital. Two of them died within the first two days after admission.

In conclusion, a few words as to treatment. It is not necessary to mention the ordinary routine which has so frequently been described before, but I wish to make a few observations of my own on the subject. Absolute rest in bed and good nursing are so fully recognised, that nothing further need be said about them. But with regard to careful dieting, opinions as to the best method vary greatly. The first point that I wish to emphasise is that I do not consider milk an ideal food for typhoid cases. It certainly contains all the essential food elements, but it also has very distinct drawbacks. In a serious case of typhoid, with a thickly coated tongue, a diet of milk adds greatly to the patient's difficulties. It is not easy to digest, forms large firm curds in the stomach, and this partially digested milk, passing into the intestines ferments and increases the tympanic distension probably already present. It also irritates the ulcerated bowel and increases or produces diarrhoea. I have often seen such a sequence of events immediately relieved by altering the diet and nothing more. In milder cases, where the tongue is fairly clean, the temperature not high, with no diarrhoea/

diarrhoea and the digestive functions consequently not seriously impaired, milk may be given, and rendered more easily digestable by the addition of sodium citrate, one grain to each ounce of milk. As was first pointed out by Sir A. Wright, the firmness of the clot in the stomach which cow's milk forms, is largely dependent on the amount of calcium salts present in it, the more there are, the firmer the clot and vice versa, to a certain extent. But, by the addition of sodium citrate, a portion of the calcium salts is precipitated and the curd which is subsequently formed is a very much softer and more flocculent one, consequently more easily digested. The milk may be peptonised, but this is more difficult than merely citrating it. However, in a serious case, when even citrated or peptonised milk cannot be digested, what is the patient to be fed upon? Soups I do not care for, they contain little nourishment and certainly tend to produce or increase diarrhoea.

The essential points to be borne in mind in dieting a typhoid patient, are firstly that the food must be easily digestable, secondly that there must be complete digestion, so that no solid residue be left to irritate the ulcerated bowel and produce diarrhoea, thirdly that the food must not ferment, and lastly that/

that it must be of such a nature as to nourish the patient, keeping in view the amount of tissue waste which goes on in a prolonged fever of this kind.

When the patient is really very ill, with a thickly coated, dry tongue, abdominal distention and diarrhoea, I have found whey by far the most useful and satisfactory article of diet, with certain additions. Whey, as is well known, contains only the salts and sugar of milk, the albumin and fat having been removed with the curd. Whey alone, therefore, does not contain all the essential elements required. So, to replace these, I have added the white of an egg or Sanatogen and with these, the best results in serious cases have certainly been obtained. It has been most striking, the marked change for the better which has taken place in a really serious case, when such a diet has been substituted for one of milk only.

My usual routine was:- whey, six ounces every two hours,- that is from three to four pints in the twenty four hours - with the addition of one drachm of Sanatogen or the white of one egg with a pinch of salt, in each feed - the Sanatogen and white of egg being given in alternate feeds. On this diet, I have kept patients for ten days to a fortnight with nothing but beneficial results. When possible, a teaspoonful of cream/

cream was also added to alternate feeds, but good cream is difficult to get in India; in future I should be inclined to try some such preparation as Virol in place of cream.

Such a diet has the recommendation of being simple and easily prepared. It is also easily administered, readily digested and absorbed, leaving very little solid residue. An attempt, at the same time, is made to supply the essential elements of diet. The whey contains the salts and sugar of milk, the albumen is replaced by Sanatogen (consisting of the casein of milk 95% and Glycero-phosphate of soda 5%) and also by that contained in the white of an egg, the fats by cream and the salts, still further increased by the addition of sodium chloride.

I have noticed that with a diet such as I have outlined, there is not the marked degree of wasting, such as I have seen when patients have been fed on milk only. This seems to point to the fact that probably a large part of the milk is not absorbed at all.

Dr Ewart, in the British Medical Journal of Dec. 9th, 1905, described a system of diet which he called "Treatment a vide", but it is certainly more difficult to carry out than the one I have detailed above, being on a much more elaborate scale. It also consists/

consists in supplying a sufficiency of every one of the essential elements of food in easily digested and assimilated form. A method of treatment somewhat similar to the one I have detailed, has been described by Dr M. Young in Public Health, Sept. 1906.

By some, a partially solid diet is given, but I, personally, have never tried this method nor seen it applied. I can not see how partially solid diet can be given with safety and benefit to a person seriously ill with typhoid.

As soon as the patient begins to improve, the tongue to clean, the tympanites to go, and the diarrhoea to cease, it is time to consider the advisability of increasing the diet, also guided largely, by the patient's inclination for food. A returning apetite is one of the best guides to increasing powers of digestion. At this stage and before the temperature has actually fallen to normal, in a case which has been seriously ill with severe abdominal symptoms pointing, in all probability, to severe ulceration, I adopt a cautious plan, and from whey proceed to peptonised milk. Next, to citrated milk, continuing the Sanatogen with, occasionally, a raw egg beaten up in it.

In less serious cases, Benger's or Mellin's Food added/

added to the milk may be given, also milky cocca or coffee.

Lastly, when the temperature has fallen to normal, I do not insist rigidly on a continuation of milk only, for a further period of ten days, but am again guided by the patient's tongue and his inclination for food. I allow a little thin bread and butter without any crust, custard pudding, bread and milk, a lightly boiled egg, and so on. Such has been my method of dieting in a large number of cases and with, I may safely say, most satisfactory results.

There is another point, which really comes under the heading of diet. I always allow a fair amount of water to be drunk. At least a pint in the twenty four hours was insisted upon, and to this was added one drop of carbolic acid and two of tincture iodine. However, I do not believe in the very copious water drinking - even up to twelve or fourteen pints in the twenty four hours - that was recommended some time ago by certain American physicians. Such an amount would certainly not be beneficial in health, and I cannot see how any good can be derived from it in a patient suffering from typhoid.

Regarding alcohol, another much debated point, and one in which both extremes have been reached, from giving/

giving it in every case and in large amounts to the opposite of avoiding its use altogether.

Personally, I steer a mid way course, putting it in the same category as any other powerful drug. Alcohol should certainly never be given as a routine practice, but only when there are clear and distinct indications for its use. So administered, it forms a valuable addition to our methods of treatment. Many cases never require a drop, children seldom needing it, but for older people and those accustomed to its use, it is more often necessary.

The chief indications for giving it are a feeble heart, as shewn by a weak first sound, rapid, weak and dicrotic pulse, dry brown tongue, sleeplessness, restlessness with tremors and muttering delirium.

As to the best form in which to give alcohol; I believe in a good, old liqueur brandy, rich in ethers. It is known to be pure, and has this great advantage, it can be given in very much smaller doses than the ordinary brandy. The question of expense may arise, but I believe it would be little more expensive in the end than ordinary brandy or whisky, on account of the much smaller quantity required. I would again repeat - never give a drop of alcohol to a typhoid patient without clear indications for its use, and stop it as soon as/

as possible. It should never be given during convalescence to improve the apetite; this is a most dangerous practice.

Should haemorrhage occur while alcohol is being administered, it should be stopped if possible. But in such a serious condition, the physician is often placed in a difficult position and it may be absolutely necessary to continue its use.

On the question of drugs, little need be said. So far, no medicine has been discovered which has any specific action in typhoid fever. Two classes of drugs though, may be mentioned. First, antipyretics, but these I have entirely abandoned in favour of other safer and more efficient methods of reducing the temperature when necessary.

Secondly, antiseptics, given with a view to lessening bacterial growth in the intestines and promoting the healing of the typhoid ulcers. Though I have tried many drugs, I cannot say I have seen any particular benefit from any one of them. Much more can be done by careful dieting, and when intestinal symptoms such as distension, diarrhoea and the like are present, the diet should be carefully revised. I will not again enlarge upon the unsuitability of milk in such conditions - such a diet undoubtedly only keeps going/

going a vicious circle and greatly interferes with the patient's chances of recovery. It is, I think, important to emphasise this.

Before concluding, I wish to mention two drugs - calcium chloride and castor oil. The former, I have often given in occasional doses during the third week, the time when haemorrhage is likely to occur. Calcium salts have also a valuable action on a debilitated heart.

Castor oil, given in small doses, one drachm every morning when necessary, I found most useful in overcoming constipation, and I never saw any ill effects that I could attribute to its use. It is also particularly beneficial during the first week of convalescence, when constipation is often so troublesome and stronger purgatives are not advisable. One drachm of castor oil given every morning produces, in the majority of cases, very satisfactory results.

When haemorrhage occurs, all food by the mouth should be entirely stopped for twelve to twenty four hours or more, only occasional sips of water should be given and the patient kept absolutely quiet with morphia, hypodermically. A large flat ice-bag may also be applied over the abdomen.

With regard to the pyrexia. I have never tried

the cold bath treatment and it appears to me to have many and serious drawbacks, especially in a hospital with a number of patients. The temperature of a patient as far as possible was never allowed to go above 103°, and when necessary, it was reduced by cold sponging or cold packing. I also found that a large ice bag suspended over the abdomen, so as to cover the greater part of it, and resting lightly thereon, was most useful in keeping down the temperature. Another method I used often, especially when it was important to disturb the patient as little as possible, consisted in laying bare the chest and arms, covering them with towels wrung out of iced water, and keeping the electric fan going slowly over the patient; at the same time an ice bag was placed over the abdomen. This seemed to me a most satisfactory way of keeping the temperature down, with the minimum of disturbance to the patient, who frequently slept soundly through it all.

Cases. See tabulated list.

In this series, sixty nine altogether, I wish to draw attention to the following points:-

(1) Age.

Under	From:-					over
5 yrs.	6 to 10.	11 to 15.	16 to 20.	21 to 25.	26 to 30.	30.
4	14	12	9	12	7	11

That is to say, 58 cases under 30 years of age, or 84%, and 11 over 30, only 16%.

The/

The large number of young children will be noted, that is among those who have been born and bred in the country. Many of these cases were received from the poorer parts of the city, where Europeans and Eurasians live in close proximity to the native population, in fact, it may be said, in the midst of it.

This series shows that typhoid fever in India, as in this country, is chiefly a disease of youth, the number of cases diminishing very markedly, after 25 years of age.

The youngest patient was a child of three, the oldest, a man of 53.

(2) Mortality. A total of six fatal cases out of sixty nine or 8.7%, can not be considered high, and this includes every case. Some of them were brought in during the later stages of their illness and died a few days after admission into hospital.

(3) Eruption. The typical spots of typhoid fever were seen in only twenty eight cases, i.e. 40.6% or less than half, shewing how often this important clinical sign is absent.

(4) Widal Reaction.	1-7 days.	8-14 days.	15-21 days.	After 21st day.
+ 1 in 20	-	3	1	1
+ 1 in 40	-	5	7	2
+ 1 in 100	6	22	9	3
Total	6	30	17	6
- 1 in 20	1	2	2	2

From/

From this it can be seen that a positive Widal was obtained at some period during the course of the illness, in 63 cases, i.e. 91.3%, a very large proportion. In four cases, when a positive reaction was obtained, I was unable to fix the day of the illness. In only six was no positive reaction obtainable.

The Widal reaction is entirely absent in some cases which can, without doubt, be clinically diagnosed as typhoid, and which proved to be so on post mortem examination. This has been noted by other observers, and so far as I have seen, it is usually in the more severe type of the disease that this reaction can not be obtained. The Widal reaction is particularly valuable in mild cases, when there is probably great doubt from clinical symptoms only. I tried to observe if any conclusions as to prognosis could be drawn from the Widal reaction, and on looking over the record of these cases, I find that in only one of the fatal cases was a positive Widal 1 in 100 obtained on the first occasion. Most of them only give a poor reaction, often merely 1 in 20, with a negative, 1 in 40. The numbers, of course, are too small to draw any conclusions from, but this is a point I shall further investigate when opportunity occurs. Unfortunately I have only full records for two years.

Had/

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

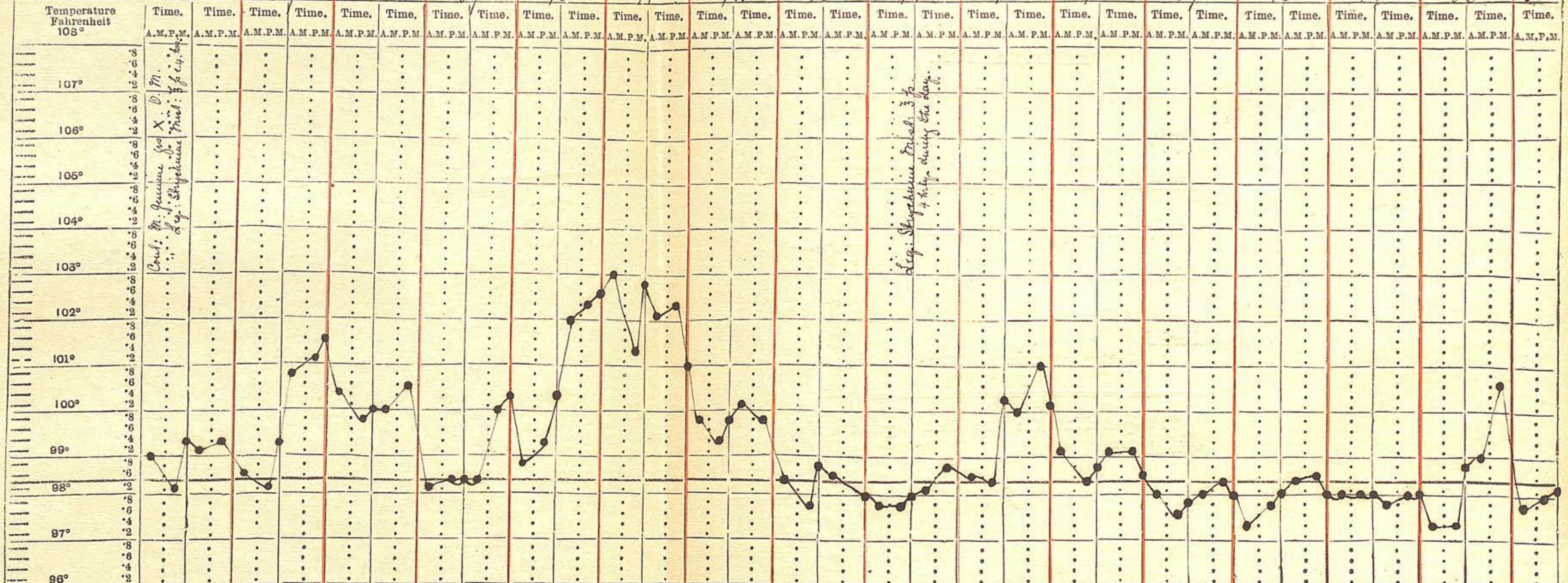
P. J. Press—A 559—1 co-11-1 906—7357—39,000—24

No. 43 (New No. 44), B. C. M. D.

Alexandra Ward. Sep: Room.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name Nurse Marks *Caste* European *Age* 22 yrs *Disease* ______ *Date of Attack* 22-6-1907. *Result* ______ *Date of Result* ______ 190 .



Dates of Observation	July 28	28	29	29	30	30	31	31	August 1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12
Days of Disease	36	36	37	37	38	38	39	39	40	40	41	41	42	42	43	43	44	44	45	45	46	46	47	47	48	48	49	49	50	50	51
Pulse per minute M.	100 / 102	96 / 96	110 / 108	120 / –	124 / 128	120 / 124	104 / 104	108 / 108	108 / 100	128 / 128	128 / 132	140 / 130	128 / 120	128 / 118	100 / 108	100 / –	90 / 92	100 / 112	100 / 104	120 / 100	112 / 112	112 / 112	104 / 104	96 / 96	96 / 100	96 / 96	100 / 100	90 / 88	92 / 100	112 / 124	88 / 100
Pulse per minute E.	112		100	128	128		102	116	128			128	128		104	100	98		120	130		108	96	96	96	88	90	88	100		90
Respirations per minute M.	20 / 20	16 / 16	20 / 20	28 / –	24 / 24	20 / 20	20 / 20	20 / 20	24 / 24	24 / 24	28 / 28	28 / 24	20 / 20	20 / 20	20 / 20	20 / –	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20	20 / 20
Respirations per minute E.				20	16		20	24	24			20	24		20	28	20		20	20		20	20	20	20	16	20	18	22		20
Bowels (No. of Stools)	0		E 1		0		E 2		0		E 1		0		E 1		0		E 1		0		E 1		0		E 1		1		

Vom: 1st

______

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

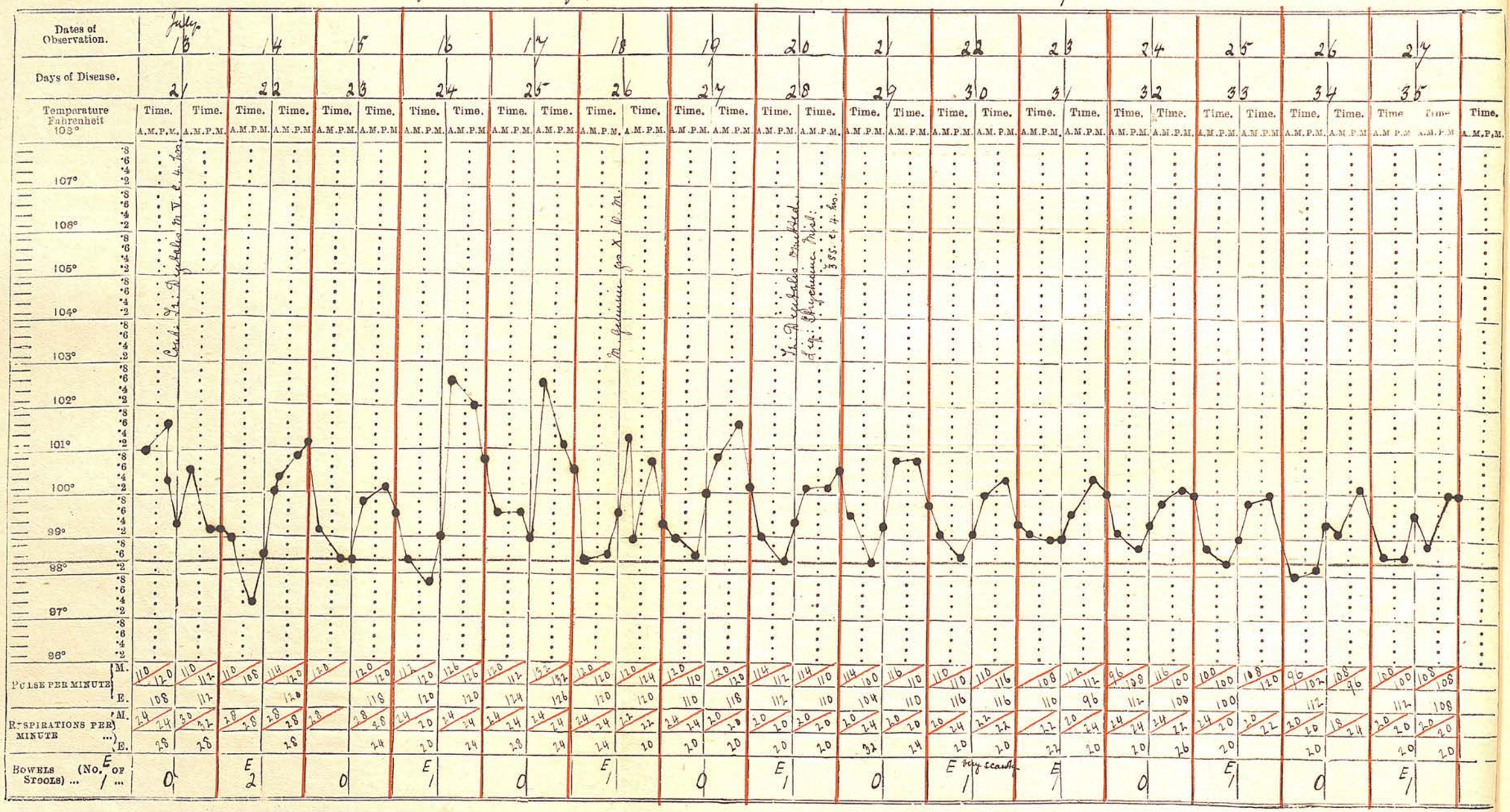
P. J. Press—A 559—1 co-11-1 906—7357—39.0'0—24

Alexandra Ward. Gen: Room.

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name Hunter Marks *Caste* European *Age* 22 yrs *Disease* _____ *Date of Attack* 22. 6. 1907. *Result* _____ *Date of Result* _____ 190



Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 559—1 co-11-1 906—7357—39.0°0-24

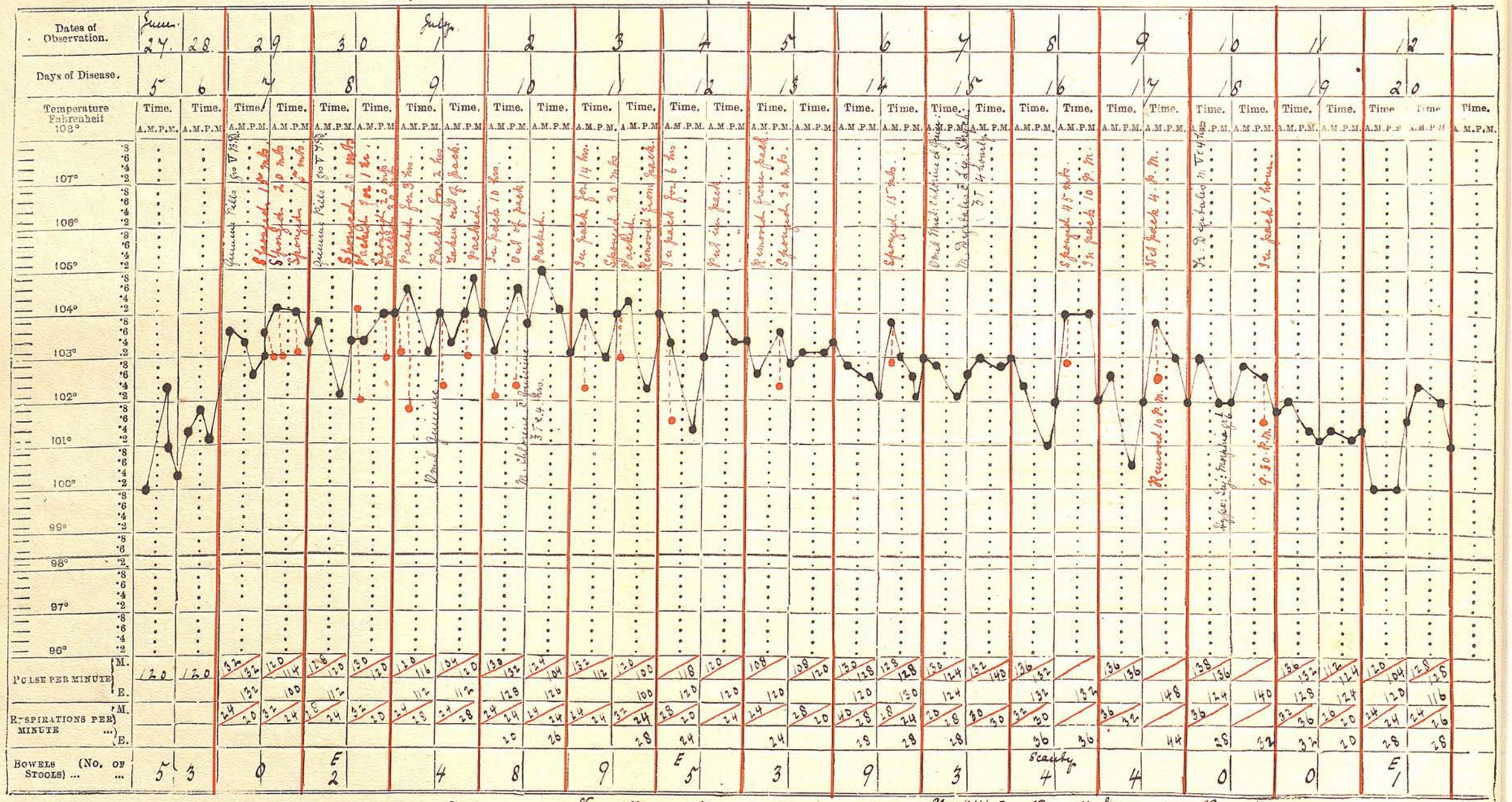
Chart No XII

Alexandra Hard. Sep: Rooms.

No. 43 (New No. 44), B. C. M. D.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name Ruben Franks. Caste European. Age 22 yrs Disease Typhoid Date of Attack 22. 6. 1907. Result _____ Date of Result _____ 190



Had I had a record of all my cases on the same lines, it might have been possible to draw more definite conclusions.

The next point so clearly brought out in this series of cases is the large number of young people attacked within a short period after their arrival in India. I consider it is our duty to strongly advise every young person, before going to India, to be inoculated against typhoid. From results which have been obtained in the army, there seems to be little doubt but that it infers a certain degree of immunity for a certain length of time. It is impossible to say how long, but probably sufficiently long to tide a new arrival over the most susceptible period. Further, when a person who has been inoculated, does contract typhoid, the attack is usually a milder one.

Chart No. XII. Nurse M.

This is the chart of an extremely severe case, with a very persistent high temperature, which necessitated continuous packing carried out, as described, with towels over the chest and arms, and ice bag to the abdomen. For about four days, this patient was quite unconscious, the pulse rose to 140 p.m. and there was haemorrhage from the bowels. She eventually made a most satisfactory recovery. The diet for nearly a fortnight/

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11-1907—7446—34,500—24

No. 43 (New No. 44), B. C. M. D. Chart No XIV Mackenzie Ward Bed 1 Room 2.

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name David Crack Caste C Age 24 Disease Paratyphoid Date of Attack 27. 6. 1908. Result _____ Date of Result _____ 190

Dates of Observation.	July 7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Days of Disease.	11?	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
107°															
106°															
105°															
104°															
103°															
102°															
101°															
100°															
99°															
98°															
97°															
96°															
Pulse per minute M.	84/82	90/90	88/80	90/88	92/80	90/74	92/86	88/88	90/80	66/64	70/68	60/64	64/60	56/70	58/52
Pulse per minute E.	100	80	90	82	98	80	96	88	66	60	64	60	60	60	52
Respirations per minute M.	28/20	26/24	24/24	22/20	20/20	24/20	20/20	28/28	30/28	16/16	20/18	20/20	18/18	18/20	24/20
Respirations per minute E.	22	28	20	16	26	16	24	28	24	16	16	20	18	20	20
Bowels (No. of Stools)	1	0	E 1	0	E 1	0	E 1	1	1						

Quinine grs xv B.D

Quinine grs v T.D

To Typhoid – 1-20
To Paratyphoid + 1-100

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11-1907- 7446—34,500—24

No. 43 (New No. 44), B. C. M. D.

Mackenzie Ward Bed 4

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name G. Coppard *Caste* E *Age* 38 *Disease* _____ *Date of Attack* 29. 7 1908. *Result* _____ *Date of Result* _____ 190 .

August

Dates of Observation.		20		21		22		23		24																							
Days of Disease.		23		24		25		26		27																							
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
107°																																	
106°																																	
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101°																																	
100°																																	
99°																																	
98°																																	
97°																																	
96°																																	
Pulse per minute { M.	60/60	70/68	60/56	70/80	60/62	68/68	80/80	72/64																									
Pulse per minute { E.	60		56	70	60	70	80																										
Respirations per minute { M.	20/24	24/20	20/28	22/20	20/24	22/18	24/22	20/20																									
Respirations per minute { E.	28	28	20	28	20		24																										
Bowels (No. of Stools)	E 2			0		2		2																									

31 oz Ricini o.m

_____

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

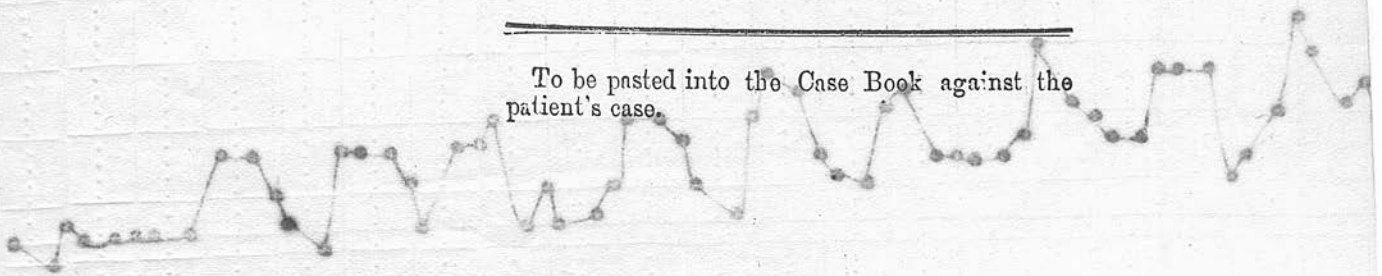
Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.



P. J. Press—A 532—16-11-1907—7446—34,500—24

Chart XIII.

No. 43 (New No. 44), B. C. M. D.

Mackenzie ward Bed 4

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name George Coppard Caste C Age 38 Disease Typhoid Date of Attack 29.7 1908. Result _____ Date of Result _____ 190 .

August

Dates of Observation.		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19	
Days of Disease.		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.		Time. A.M. P.M.	Time. A.M. P.M.
107°																															
106°																															
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99°																															
98°																															
97°																															
96°																															
PULSE PER MINUTE M.		96 / 88		72 / 68		68 / 72		78 / 76		60 / 60		80 / 80		78 / 72		78 / 72		74 / 68		80 / 66		72 / 68		80 / 72		74 / 72		64 / 72		66 / 60	
PULSE PER MINUTE E.		80		72		80		80		66		80		78		64		68		76		72		72		72		74		72	
RESPIRATIONS PER MINUTE M.		24 / 24		20 / 20		16 / 24		32 / 32		32 / 24		28 / 28		28 / 28		28 / 24		24 / 24		24 / 24		16 / 20		20 / 26		28 / 20		20 / 20		20 / 24	
RESPIRATIONS PER MINUTE E.		26		28		20		32		28		28				24		24		24		20		24		20		24		24	
BOWELS (No. OF STOOLS)		P 1		2		0		E 1		0		E 1		0		E 1		0		E 1		0		E 1		0		E 1		0	E 1

Quinine grs X t.d.

Quinine grs X t.d.

Mist Saline.

Vomited

Widal - 1 in 20

Widal + 1 in 40 Partial 1 in 100

Signature.

fortnight consisted of nothing but whey, white of egg and Sanatogen.

Widal was positive 1 in 100 on the ninth day.

Chart No. XIII. G. C.

A marked contrast to the former in every respect. An exceedingly mild type, with the temperature, after the first three days, seldom above 101°. None of the characteristic signs of typhoid were present. The first Widal was negative 1 in 20 on the thirteenth day of illness, but the second, on the twentieth day, gave a positive 1 in 40 and a partial 1 in 100, leaving no doubt as to the nature of the fever. The patient was treated as an ordinary typhoid on account of the continuity of the fever, the absence of any malarial parasites, and the fact that quinine had no effect upon the fever.

Chart No. XIV. D. C.

This is interesting as being the chart of a patient admitted for fever of a continuous nature. Widal was negative 1 in 20, and the temperature fell to normal, five days after admission. Treated as a mild typhoid, and eventually discharged.

The patient had not been out of hospital for a week when he returned with fever, looking extremely ill.

This/

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11-1907—7446—34,500—24

No. 43 (New No. 44), B. C. M. D.

MacKenzie Ward Bed 20

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name G. Turner *Caste* C. D *Age* 35 *Disease* _____ *Date of Attack* 12. 8. 1908. *Result* _____ *Date of Result* _____ 190 .

September

Dates of Observation.		3		4		5																										
Days of Disease.		23		24		25																										
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
107°																																
106°																																
105°																																
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102°																																
101°																																
100°																																
99°																																
98°																																
97°																																
96°																																
PULSE PER MINUTE M.		84/84	96/72	72/72	80/76	76/72	96/90																									
PULSE PER MINUTE E.		84	72	72		72	88																									
RESPIRATIONS PER MINUTE M.		32/32	32/28	24/24	20/28	24/24	28/24																									
RESPIRATIONS PER MINUTE E.		32	26	24		24	20																									
BOWELS (No. OF STOOLS)	E	2		2		0	E																									

Widal for Typhoid + Paratyphoid - 1 in 20

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11 1907- 7446—34,500—24

No. 43 (New No. 44), B. C. M. D. Chart XVI Mackenzie ward Bed 20

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name George Turner. *Caste* C. D *Age* 35 *Disease* Typhoid *Date of Attack* 12. 8. 1908. *Result* _____ *Date of Result* _____ 190

August – Sept –

Dates of Observation.	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2
Days of Disease.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pulse per minute M.	64 / 96	100 / 80	64 / 64	60 / 72	64 / 70	70 / 72	60 / 70	76 / 88	66 / 70	88 / 72	90 / 90	80 / 80	84 / 84	80 / 90	72 / 80
Pulse per minute E.	96	80	64	72	70	60	64	80	80	72	80	80	96	80	80
Respirations per minute M.	18 / 24	24 / 24	24 / 24	30 / 36	24 / 32	30 / 24	40 / 36	32 / 24	32 / 36	36 / 36	24 / 30	36 / 36	30 / 32	40 / 56	40 / 40
Respirations per minute E.	24	20	24	32	28	20	40	32	36	36	32	36	36	36	40
Bowels (No. of Stools)	0	P5	1	1	0	1	0	E 1	0	4	2	1	1	3	

Dates of Observation.	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Days of Disease.	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
Pulse per minute M.	84 / 84	80 / 90	72 / 80	104 / 100	120 / 100	100 / 90	88 / 100	90 / 78	80 / 100	100 / 92	96 / 90	98 / 84	88 / 104	96 / 96	100 / 76	88 / 80	100 / 82	77 / 72																			
Pulse per minute E.	96	80	64	72	70	60	64	80	80	72	80	80	96	80	80	92	100	88	92	100	84	88	76	72													
Respirations per minute M.	30 / 32	40 / 56	40 / 40	44 / 44	44 / 40	36 / 40	28 / 36	34 / 36	32 / 44	38 / 36	24 / 44	42 / 44	30 / 40	36 / 36	40 / 40	36 / 36	40 / 36	32 / 32																			
Respirations per minute E.	36	40	40	34	40	40	48	36	32	36	48	20	38	44	38	30	32	32																			
Bowels (No. of Stools)																																					

Misf chlorine ℥i / Quin: Sulph grs iii (4 hrly) / Tr digitalis mv

Quinine grs x B.D

Quinine grs v T.D

Vomit 1

Vomit 1

Widal – 1 in 20

Vomit 1

Widal – 1 in 20

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11 1907—7446—34,500—24

No. 43 (New No. 44), B. C. M. D.

Mackenzie ward Bed 1

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name A. Eiben *Caste* G. *Age* 26 *Disease* _____ *Date of Attack* 13. 8 1908. *Result* _____ *Date of Result* _____ 190

August September

Dates of Observation.		29		30		31		1		2		3		4		5		6		7		8		9		10		11		12	
Days of Disease.		17		18		19		20		21		22		23		24		25		26		27									
Temperature Fahrenheit 108°	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
107°																															
106°																															
105°																															
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100°																															
99°																															
98°																															
97°																															
96°																															
PULSE PER MINUTE M.		92/80	88/80	88/86	80/92	100/84	72/80	80/72	72/64	84/72	72/72	68/72	80/80	76/64	96/76	68/60	88/72	80/60	58/56	60/56	50/60	60/64	48/50								
PULSE PER MINUTE E.		84	80	76	88	64	88	68	80	72	64	72	76	64	68	60	60	60	72	48		72									
RESPIRATIONS PER MINUTE M.		24/28	22/20	24/28	22/24	24/20	20/20	24/24	24/24	28/24	24/22	24/24	24/20	20/20	20/28	22/20	24/24	20/16	28/20	16/20	18/16	16/20	28/26								
RESPIRATIONS PER MINUTE E.		28	20	24	28	24	24	24	24	24	22	24	20	20	24	20	20	20	20	20		20									
BOWELS (No. OF STOOLS)		6		4		3		4		2		2		2		2		2		1											

Packed 24 hrs

Slaneh et opii Enema

Widal - 1 in 20

Signature.

CLINICAL CHART.

RECORD

OF

TEMPERATURE, PULSE, AND RESPIRATION.

Caste _____

Name _____

Hospital or Dispensary _____

Disease _____

Period { *From* _____ / *To* _____

To be pasted into the Case Book against the patient's case.

P. J. Press—A 539—16-11 1907—7446—34,500—24

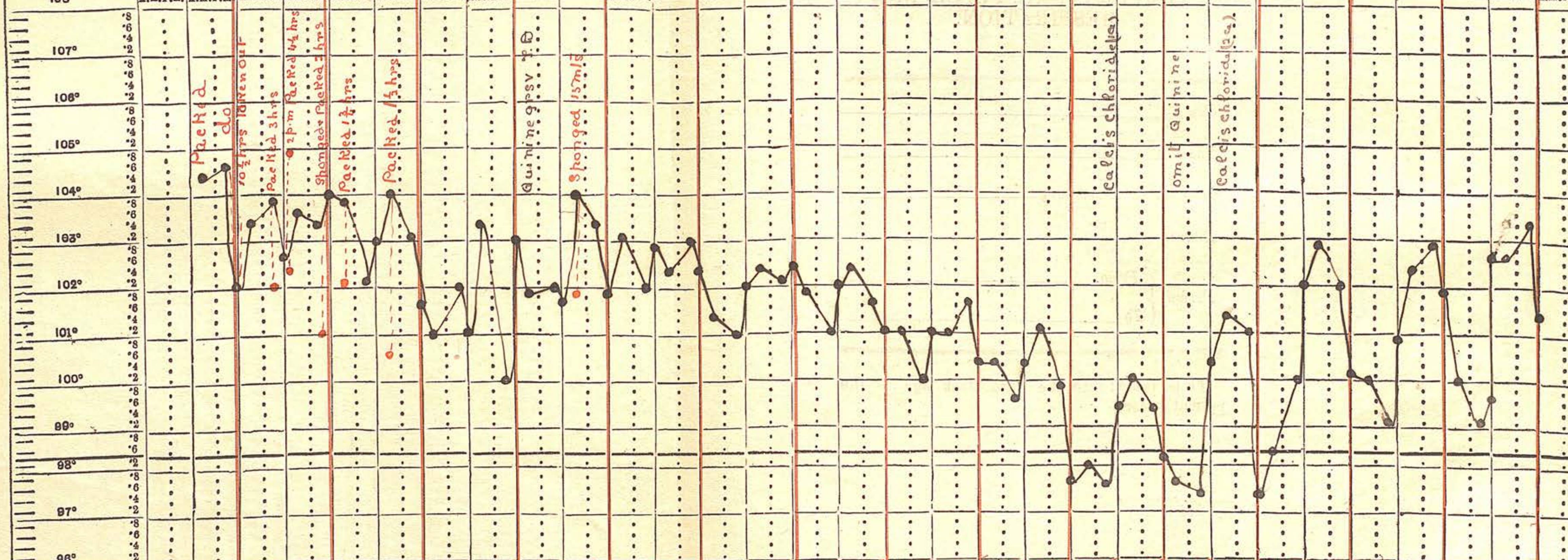
No. 43 (New No. 44), B. C. M. D. Chart XV   Mackenzie Ward Bed 1

RECORD OF TEMPERATURE, PULSE, AND RESPIRATION.

Name A Cuben *Caste* German *Age* 26 *Disease* Typhoid F. *Date of Attack* 13.8 1908. *Result* ______ *Date of Result* ______ 190 ,

August

Dates of Observation / Days of Disease / Temperature Fahrenheit 108° — Time. A.M.P.M. (31 columns)



Columns	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dates of Observation		14		15		16		17		18		19		20	
Days of Disease		2		3		4		5		6		7		8	
Pulse per minute M.		112	96/94	88/88	84/88	84/80	78/76	70/70	66/68	70/66	88/60	72/64	80/72	70/70	72/76
Pulse per minute E.		80	64	96	96	90	72	68	80	80	70	66	72	80	64
Respirations per minute M.		24/28	24/28	28/28	34/24	30/26	24/24	30/26	28/26	30/30	28/30	30/30	28/28	26/28	28/24
Respirations per minute E.		28	28	26	24	26	24	28	28	30	30	30	28	28	30
Bowels (No. of Stools)		3		3		5		4		5		3		1	

Columns	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Dates of Observation	21		22		23		24		25		26		27		28	
Days of Disease	9		10		11		12		13		14		15		16	
Pulse per minute M.	80/72	84/80	60/60	76/60	72/80	70/64	64/60	64/64	84/88	76/80	104/96	84/72	90/92	80/74	98/84	
Pulse per minute E.	76	84	60	80	76	60	80	88	84	88	84	72	88	72	84	
Respirations per minute M.	28/24	26/24	20/18	28/26	24/24	20/20	20/20	20/20	28/24	18/20	28/24	24/24	28/28	24/20	24/22	
Respirations per minute E.	28	26	28	24	24	22	22	20	18	20	22	24	28	20	24	
Bowels (No. of Stools)	3		2		4		3		3		6		7		6	

Widal - 1 in 20   Widal - 1 in 20   haemorrhage   haemorrhage   haemorrhage   haemorrhage (slight)

Signature.

This time he went through a severe attack of typhoid, and Widal gave a positive reaction 1 in 100.

Charts XV & XVI. A. G. & G. T.

Two charts of typical typhoid cases, in neither of whom could a positive Widal be obtained, although the serum was tested on three occasions at intervals, in each case. Both showed typical signs, and No. XV had severe harmorrhage more than once - indeed, both may be described as severe attacks.

This, then, concludes a brief description of the "fevers" met with in Calcutta. In past years, many others were described, but by improved methods of diagnosis they have almost all been absorbed into one of the classes mentioned. Thus, the "non-malarial remittent fever" written of by Dr Crombie as occurring in natives, is probably nothing more than typhoid fever, and not a distinct fever by itself. The description he gives of it corresponds exactly to typhoid, and it must be remembered that at the time he wrote his description of this fever, typhoid was considered to be extremely rare in natives. Some then maintained it did not occur at all, but this we now know well is not the case.

Again, "low fever", as it was called, was considered/

considered, clinically, a distinct fever, being described as "a persistent low elevation of temperature unaccompanied by any constant symptoms; of indefinite duration and uninfluenced by quinine or arsenic." (Dr Crombie). This is undoubtedly, in the majority of cases, simply a stage in the development of Kala-azar or spleen fever which I mentioned, when speaking of that fever. It is extremely doubtful if it exists as a separate form. I have tried to shew that the important fevers of India can be distinctly separated from each other, and the diagnosis, in most cases, accurately made by careful clinical investigation combined with a blood examination for parasites, and for a total and a differential leucocyte count. Finally, the serum test.

No. of case.	Age & length of residence in India.	Widal Reaction with date of observation.	Result.	Remarks.
1.	25 C.B.	- 1 in 20 on 6th day of illness. + 1 in 40 on 14th day.	Recovery.	An uncomplicated case. Spleen could be felt below costal margin on 6th day. A few typical spots present.
2.	43	+ 1 in 100 on 10th day.	R.	A severe attack; spleen felt on 10th day of illness; numerous typical spots.
3.	17 C.B.	- 1 in 20 on 13th day. + 1 in 40 on 26th day.	R.	Spleen felt on 12th day; numerous spots; no complications.
4.	26 8 mns.	- 1 in 20 on 10th day. + 1 in 20) partial(on 18th day. 1 in 40)	R.	Mild attack.
5.	8 5 mns.	+ 1 in 20) partial(12th day. 1 in 40)	D.	Admitted on 10th day of illness seriously ill; cerebral symptoms and haemorrhage; died two days after admission.
6.	28 2 years.	- 1 in 20 8th day. - 1 in 20 13th day.	D.	Very severe attack with marked abdominal symptoms and high tem Both corneae completely sloughe A positive Widal was here never obtained, and P.M. examination was refused; but there was little doubt as to the diagnosi
7.	8 C.B.	+ 1 in 100 19th day.	R.	Patient during the course of th illness had very severe fits, necessitating the use of chlorc form, otherwise no complicatior
8.	4 C.B.	+ 1 in 100 7th day.	R.	Mild attack.
9.	6 C.B.	+ 1 in 20) partial(9th day. 1 in 40)	R.	Fairly severe attack. Few spots.
10.	15 C.B.	+ 1 in 100 8 th day.	R.	Typical case, free from complications.
11./				

11.	27	+1 in 20) partial(15th day. 1 in 40)	D.	A sailor from Bombay, where he had contracted the fever; seriously ill when admitted to hospital; had been ill on the voyage from Bombay to Calcutta with no medical attendance High fever attended with prcfuse perspiration; temp. rose to 108.8° just before death.
12.	1. - 1 in 20 9th day. 6. 2. + 1 in 40 10th day. - 1 in 100 C.B.3. + 1 in 100 37th day.		R.	Very severe attack with diarrhoea, abdominal distension, congestion of both lungs and continued high temp. Note the Widal reaction, how from a negative one on the 9th day it gradually increased till a positive reaction of 1 in 100 was obtained on 37th day of illness.
13.	13 C.B.	+1 in 100 11th day	R.	Moderately severe attack.
14.	8 14 mns.	+1 in 100 ?	R.	Severe attack.
15.	15 C.B.	+1 in 100 9th day.	R.	Mild attack; few spots noticed.
16.	23 19 yrs.	+1 in 100 17th day.	R.	do. do.
17.	10 C.B.	- 1 in 20 10th day. +1 in 100 19th day.	R.	Severe attack; few spots seen.
18.	12 C.B.	- 1 in 20 10th day. - 1 in 20 21st day.	R.	Went through what appeared to be a typical attack of typhoid but no Widal reaction obtained; no spots; spleen enlarged, the enlargement disappearing during convalescence.
19.	22 ?	+ 1 in 100 9th day.	R.	Extremely severe case with persistent high temp., unconsciousness, delirium, etc.
20.	11 C.B.	+ 1 in 100 15th day.	R.	Severe attack.
21.	21 14 days.	+1 in 100 11th day.	D.	Extremely virulent attack with diarrhoea, persistent high temp. harmorrhage, abd. distension. Numerous petechial haemorrhages appeared over abdomen and lower chest which extended and formed large harmorrhaeic patches. Patient had only been 14 days in Calcutta, in fact in India.
22./				

22.	25 C.B.	+ 1 in 100 11th day.	R.	Interesting case from the fact tha at first the attack was extremely mild, so much so one would have been doubtful as to the diagnosis but for a very positive Widal reaction. In spite of warnings patient sat up too soon and after tha went through an extremely severe recrudescence.
23.	6 C.B.	+1 in 100 7th day.	R.	Admitted on 3rd day of illness wit pneumonia consolidation at left base. Persistent high temp. and diarrhoea made one suspect typhoid and this suspicion was verified by a very positive Widal reaction.
24.	12 C.B.	+1 in 100 10th day.	R.	Typical moderately severe attack.
25.	38 7 mns.	1. -1 in 20 11th day. 2. +1 in 20) partial(24th day. 1 in 40)	R.	Note the Widal reaction although a second attack. First, five years ago. Mild attack; temp. never ver much above 102°.
26.	13 C.B.	+1 in 100 10th day.	R.	Moderately severe attack with abdominal distension and dry furred tongue.
27.	24 3 weeks.	+1 in 100 11th day.	R.	do. do. do. A few spots noticed.
28.	17 9 mns.	+1 in 100 15th day.	R.	Had been suffering from "fever" fo ten days before admission. Admitted with dry coated tongue, abdominal distension and diarrhoea.
29.	36 10 mns.	+1 in 100 15th day.	R.	Had continuous fever for 11 days before admission.
30.	24 16 mns.	+1 in 40 11th day.	R.	Mild case, spots present.
31.	9 C.B.	+1 in 100 17th day.	R.	Severe attack; fever had been present for some time before admission.
32.	9 C.B.	+1 in 100 14th day.	R.	Severe, with abdominal symptoms and pneumonia.
33.	26 2 mns.	+1 in 40 8th day.	D.	Very severe with diarrhoea through out, numerous spots, severe haemorrhage and numerous petechial haemorrhages over abdomen. Large slough passed in the stools.
34.				

34.	30	+1 in 100 9th day.	R.	Severe attack with diarrhoea and congestion of both lungs, also marked recrudescence.
35.	12 C.B.	+1 in 100 6th day.	R.	Severe attack with persistent high temperature.
36.	4 C.B.	+1 in 100 16th day.	R.	Temp. fell to normal the day after admission; had had continuous fever for 15 days before coming to hospit
37.	18 C.B.	+1 in 100 9th day.	R.	Mild attack; temp. never high.
38.	10 C.B.	1. -1 in 20 25th day. 2. +1 in 100 33rd day.	R.	Continuous fever for 24 days before admission; severe attack with marked abdominal, lung and cerebral symptoms.
39.	13 C.B.	+1 in 100 15th day.	R.	Continuous fever for 14 days before admission with diarrhoea and distended abdomen. Severe attack, did well after admission to hospital.
40.	6 C.B.	+1 in 100 7th day.	R.	A mild attack.
41.	4½ C.B.	+1 in 100 6th day.	R.	do. Brother of No. 40.
42.	8 C.B.	1. Partial 1 in 20 8th day. 2. +1 in 100 26th day.	R.	Brother of Nos. 40 & 41. All three in hospital together. Fever for six days duration before admission and only for three days after admission. Tongue thickly coated. Had it not been for the association with his two brothers I doubt if typhoid would ever have been suspected. First Widal was practically negative. He was however treated as typhoid. Yet in spite of all care in diet, etc. he had a sharp recrudescence on 23rd Feb., 21st day of his illness, and during this a second Widal gave a positive 1 in 100 reaction.
43.	53 30 yrs.	+1 in 100 10th day.	R.	Mild case, Few spots seen.
44.	13 C.B.	+1 in 100 10th day.	R.	Severe attack with dry coated tongue and diarrhoea. Few spots; persistently high temp. kept down by packing and ice-bags.
45.	18 C.B.	+1 in 40) -1 in 100) 17th day.	R.	Very severe case with pneumonia and cerebral symptoms. Continuous fever for 14 days before admission. Had a relapse after being normal for seven days.
46.				

46.	45.	1. -1 in 20 8th day. 2. partial) 1 in 20(18th day. -1 in 40) 3. +1 in 40) -1 in 100)34th day.	R.	Admitted on 5th day of illness ar on 12th day patient had a severe haemorrhage which recurred twice, but patient did well.
47.	$3^{3}/12$ C.B.	+1 in 100 12th day.	R.	This was my youngest case; went through a typical attack complicat ed with broncho-pneumonia. Few spots noticed.
48.	36 11 mns.	1. -1 in 20 15th day. 2. +1 in 20) -1 in 40) 22nd day.	R.	Patient had had a previous attack of typhoid; went through a typic- ally mild attack on this occasion.
49.	16 C.B.	1. -1 in 20 10th day. 2. -1 in 20 28th day.	R.	Mild uncomplicated attack, possibl of the nature of a paralyphoid. Spots present; positive Widal was not obtained.
50.	32 C.B.	+1 in 40) -1 in 100)11th day.	R.	Mild case.
51.	21	+1 in 100 10th day.	R.	Patient had only been one day in Calcutta, came from Bombay in his ship and the fever was probably contracted there; ten days' fever on board before admission; very drowsy when admitted with thickly coated tongue.
52.	24 6 wks.	-1 in 20 to Typhoid B. 13th day. +1 in 100 to Para- phoid B.	R.	Spleen could just be felt, spots were present, mild attack. But about ten days after discharge from hospital patient was again ad mitted and went through a very muc more severe attack and on this oc- casion a positive reaction 1 in 1C was obtained to typhoid Bacillus.
53.	6 C.B.	+1 in 40) partial(10th day. 1 in 100)	D.	Very severe case with pulmonary ar cerebral symptoms and very high temperature, child admitted on 8th day of illness, then seriously ill
54.	22. 3 days.	+1 in 100 9th day.	R.	At first thought to be rheumatic c account of severe pains in the joints; spots present. Sailor fr Bombay, only three days in Calcutt
55.	19 C.B.	+1 in 100 ? day.	R.	Very indefinite history; said to have had continuous fever for the past two months. History rather su -gested Kala-azar, liver and splee both slightly enlarged but Widal r -action was positive and patient made a complete recovery.

56.	32.	+1 in 100 13th day.	R.	Admitted with severe biliary colic jaundice and fever. Spleen could be felt and as temperature continued high, tyhpoid was suspected, and the Widal proved that such was the case.
57.	38 8 yrs.	1. -1 in 20 13th day. 2. +1 in 40) partial(20th day. 1 in 100)	R.	Very mild attack. Example of a ca of typhoid with very low fever, the type of case difficult to diagnose and easily overlooked, and in whic a positive Widal is of such great assistance. No spots, no enlargement of spleen, no diarrhoea, only slight but persistent fever.
58.	29 2 mns.	+1 in 100 6th day.	R.	Moderately severe attack with recrudescence.
59.	35 C.B.	1. -1 in 20 13th day. 2. -1 in 20 20th day. 3. -1 in 20 both to typhoid and paraly-phoid 24th day.	R.	Example of a case in which the patient went through a typical attack of typhoid fever; persistent high temperature, coated tongue, slight enlarged spleen. Fever terminatin by lysis and yet a positive reacti to Widal could not be obtained.
60.	20 C.B.	partial 1 in 20 9th day.	R.	Mild attack.
61.	25 6 mns.	+1 in 100 8th day.	R.	A very severe attack with all the characteristic signs, persistent high temperature, spleen enlarged below costal margin, marked cardia weakness, numerous typical spots and persistent diarrhoea.
62.	15 C.B.	+1 in 100 8th day.	R.	Mild attack, no complications.
63.	22 10 yrs.	+1 in 100 ? day.	D.	Admitted to hospital for pulmonary phthisis. Developed typhoid, severe attack, recovered from typhoid, died from a severe haemoptysis.
64.	17 C.B.	not examined.	R.	Mild attack.
65.	26 1½ mns.	1. -1 in 20 4th day. 2. -1 in 20 12th day. 3. -1 in 20 18th day.	R.	An extremely severe attack. Interes -ing from the fact that although th patient went through a typical attack of severe typhoid characterise by high fever, thickly coated tongu typical spots, enlarged spleen, and complicated by severe harmorrhage from the bowels, yet a positive Widal was never obtained. There were also severe joint complications, acute syncritis, with effusion of right knee and elbow during convalescence.

66.	45 3 yrs.	+1 in 100 12th day.	R.	Mild attack with few typical spots. A distinct relapse on 44th day afte temperature had been normal for 13 days.
67.	16 3 yrs.	+1 in 100 22nd day.	R.	Admitted to hospital on 21st day of his illness seriously ill and in a wretched condition with huge bed-sore. Widal gave a positive reaction of 1 in 100 at once and patient eventually made a good recovery.
68.	9 C.B.	+1 in 100 9th day.	R.	Admitted to hospital with a normal temperature but child was looking and obviously felt very ill. From day of admission temperature began to rise in a typical manner of typhoid fever. Child was evidently sickening for typhoid on admission. No complications, but patient had two sharp recrudescences, on both occasions before any solid food had been given.
69.	13 C.B.	+1 in 100 9th day.	R.	A typical fairly severe attack, spots present.

Note.

C.B. stands for Country Born, meaning thereby that the patient of European parentage had been born and brought up in India.

In all cases in which typical spots were present, a note has been made of their presence and from this brief outline of sixty nine cases it will be seen how frequently they are absent.